United States Department of the Interior

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JUL 1 3 2010

Peter J. Hartman
Division Administrator
Idaho Division
Federal Highway Administration
3050 Lakeharbor Lane, No. 126
Boise, Idaho 83703

David B. Barrows
Chief, Regulatory Division
Walla Walla District
US Army Corps of Engineers
201 North 3rd Avenue
Walla Walla, Washington 99362

Dear Mr. Hartman and Mr. Barrows:

Subject: Programmatic Idaho Transportation Department Statewide Federal Aid, State, and Maintenance Actions—Idaho Statewide—Biological and Conference Opinions 1102.0200 14420-2010-F-0287

Enclosed are the Fish and Wildlife Service's (Service) Biological and Conference Opinions (Opinion) and concurrence with the Federal Highway Administration and the Army Corps of Engineers' (Agencies) determinations of effect on species listed under the Endangered Species Act (Act) of 1973, as amended, for the proposed Programmatic Idaho Transportation Department Statewide Federal Aid, State, and Maintenance Actions (Program) throughout the state of Idaho, and implemented predominately by the Idaho Transportation Department (Department). In a letter dated March 22, 2010, and received by the Service on March 25, the Agencies requested formal consultation on the determination under section 7 of the Act that the proposed Program is likely to adversely affect the bull trout (*Salvelinus confluentus*) and its designated and proposed critical habitat, the Utah valvata snail (*Valvata utahensis*), Snake River physa snail(*Haitia (Physa) natricina*), Bliss Rapids snail (*Taylorconcha serpenticola*), and the northern Idaho ground squirrel (*Spermophilus brunneus brunneus*).

The Agencies determined that the proposed Program is not likely to adversely affect the Kootenai white sturgeon (*Acipenser transmontanus*) and its critical habitat, the Banbury Springs lanx (*Lanx sp.*), the Bruneau hotspring snail (*Pyrgulopsis bruneauensis*), the Selkirk Mountain caribou (*Rangifer tarandus caribou*), the grizzly bear (*Ursus arctos horriblis*), the Canada lynx (*Lynx canadensis*) and its critical habitat, MacFarlane's four-o'clock (*Mirabilis macfarlanei*), the water howellia (*Howellia aquatilis*), the Ute ladies'-tresses (*Spiranthes diluvialis*), the Spalding's catchfly (*Silene spaldingii*), and the slickspot peppergrass (*Lepidium papilliferum*); you requested our concurrence with these determinations.

The enclosed Opinions and concurrence are based primarily on our review of the proposed action, as described in your March 2010 Biological Assessment (Assessment) prepared by the Idaho Transportation Department (the implementing agency), and the anticipated effects of the action on listed species and proposed and designated critical habitat. Our Opinions, prepared in accordance with section 7 of the Act, conclude that the proposed Program will not jeopardize the survival and recovery of any listed species or adversely modify any designated or proposed critical habitat. A complete record of this consultation is on file at this office.

The Service will complete and publish a Final Rule in the Federal Register for the rangewide designation of bull trout critical habitat by September 30, 2010. As the Program will be implemented for five years and we expect critical habitat to be designated in the action area, the Agencies may ask the Service to confirm this conference opinion for critical habitat as a biological opinion issued through formal consultation. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or the information used during this conference, we will confirm the conference opinion as the biological opinion for the Program and no further section 7 consultation will be necessary for bull trout critical habitat.

Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Clay Fletcher at (208) 378-5256 if you have questions concerning this Opinion.

Sincerely,

Gary L Burton

Gary L. Burton, Acting State Supervisor
Idaho Fish and Wildlife Office

Enclosure

cc: NOAA, Boise (Leonard)
FHWA, Boise (Inghram)
COE, Walla Walla (Mitchell)
ITD, Boise (Sullivan)
ITD, Lewiston (Funkhouser)
ITD, Shoshone (Jones)
ITD, Rigby (Cramer)
FWS, Spokane (Holt)
FWS, Chubbuck (Laye)

BIOLOGICAL AND CONFERENCE OPINIONS FOR THE PROGRAMMATIC IDAHO TRANSPORTATION DEPARTMENT STATEWIDE FEDERAL AID, STATE, AND MAINTENANCE ACTIONS

14420-2010-F-0287

July 2010

FISH AND WILDLIFE SERVICE
IDAHO FISH AND WILDLIFE OFFICE
BOISE, IDAHO

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1. BACKGROUND AND INFORMAL CONSULTATION

1.1 Introduction

The Fish and Wildlife Service (Service) has prepared this Biological and Conference Opinions (Opinion) on the effects of the Programmatic Idaho Transportation Department Statewide Federal Aid, State, and Maintenance Actions (Program[1]) on the bull trout (*Salvelinus confluentus*) and its proposed and designated critical habitat, Utah valvata snail (*Valvata utahensis*), Snake River physa snail (*Haitia* (*Physa*) *natricina*), Bliss Rapids snail (*Taylorconcha serpenticola*), and the northern Idaho ground squirrel (*Spermophilus brunneus brunneus*). In a letter dated March 22, 2010, and received by the Service on March 25, the Federal Highways Administration (FHWA) and the Army Corps of Engineers (COE) (Agencies) jointly requested formal consultation with the Service under section 7 of the Endangered Species Act (Act) on the effects to listed species from actions carried out under the Program.

As lead agency for federal aid project actions involving highway projects, the FHWA is responsible for compliance with section 7 of the Act. The FHWA has delegated authority to the Idaho Transportation Department (Department) for preparation of biological evaluations and biological assessments, and to conduct informal consultation with the Service and the National Marine Fisheries Service (NMFS) – referred to collectively as the Services.

The COE is responsible for ensuring compliance with section 7 of the Act for projects that require Department of the Army permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act of 1899. The COE is the lead federal agency for state-funded projects that require a Department of the Army (DA) permit. The COE has also designated the Department as a non-federal representative for section 7 consultation on actions covered under the Program.

The Department, in cooperation with the FHWA, the COE, the NMFS and the Service, developed this Programmatic Biological Assessment (Assessment) to document projects and consult, on a statewide level, under section 7 of the Act, on the Department actions described herein.

The Department determined that the proposed action is likely to adversely affect the species listed above. As described in this Opinion, and based on the Biological Assessment (Assessment) developed by the Department and other information, the Service has concluded that the action, as proposed, is not likely to jeopardize the continued existence of these species or result in any adverse modification of designated or proposed critical habitat.

The Department has also determined the Program is not likely to adversely affect the Kootenai River white sturgeon (*Acipenser transmontanus*) and its critical habitat, the Banbury Springs lanx (*Lanx* sp.), the Bruneau hot spring snail (*Pyrgulopsis bruneausensis*), the Selkirk Mountain caribou (*Rangifer tarandus caribou*), the grizzly bear (*Ursus arctos horribilis*), the Canada lynx (*Lynx canadensis*) and its critical habitat, MacFarlane's four-o'clock (*Mirabilis macfarlanei*), the water howellia (*Howellia aquatilis*), the Ute ladies'-tresses (*Spiranthes diluvialis*), the Spalding's

[1]"Program" refers to all maintenance activities, processes, and best management practices addressed in the Programmatic Assessment and will be used throughout this Opinion to refer to these components.

catchfly (*Silene spaldingii*), and the splickspot peppergrass (*Lepidium papilliferum*). In this document, the Service is providing concurrence with those determinations.

The Agencies are consulting separately with the NMFS on the effects of the proposed Program on the sockeye salmon (*Oncorhynchus nerka*), spring/summer Chinook salmon (*Oncorhynchus tshawytscha*), fall Chinook salmon (*Oncorhynchus tshawytscha*), and steelhead (*Oncorhynchus mykiss*).

1.2 Consultation History

July 22-29, 2008	The Service received an e-mail from the Department requesting suggestions on how to structure the Assessment for the Program. We provided an example of a programmatic assessment to the Department via e-mail.
August 14, 2008	The Service participated in a conference call with the Department and the NMFS to discuss some of the various types of maintenance projects to be included in the Assessment as well as how to structure the Assessment.
August 21, 2008- November 2, 2009	The Service received an e-mail from the Department with the draft Assessment attached. We reviewed several iterations of the draft Assessment, attended four interagency meetings to discuss the draft Assessment, and provided comments on the draft Assessment.
November 3, 2009	The Service sent the Department comments on critical habitat for the Canada lynx via e-mail.
December 3, 2009	The Service attended a meeting with the Department, FHWA, the COE, and NMFS to discuss the draft Assessment.
December 7, 2009	The Service sent the Department via e-mail information on when the Federal Register notice for proposed bull trout critical habitat would be published and the information would be available for inclusion in the Assessment.
January 14, 2010	The Service sent the Department, via e-mail, information on proposed bull trout critical habitat for inclusion in the Assessment.
February 11, 2010	The Service sent the Department, via e-mail, language on designated bull trout critical habitat for incusion in the Assessment.
February 16, 2010	The Service sent the Department an e-mail with comments on a table on listed species by river basin for inclusion in the Assessment.
February 22, 2010	The Service sent an e-mail response to the Department approving the inclusion of small structure repair as an additional work type in the Assessment.
February 24, 2010	The Service received an e-mail from the Department indicating that the final Assessment was transmitted to the Department Headquarters (HQ).

	The e-mail stated that HQ would submit the Assessment to FHWA and the COE for final submittal to the Services.
February 25, 2010	The Service sent an e-mail to the Department stating errors in the final Assessment.
March 19, 2010	The Service sent an e-mail to the Department providing language on candidate species for inclusion in the Assessment.
June 29, 2010	The Service sent a draft version of this Opinion via e-mail to the Agencies for review.

1.3 Informal Consultations

1.3.1 Kootenai River White Sturgeon and Critical Habitat

Service concurrence that the proposed Program is not likely to adversely affect the Kootenai white sturgeon and its critical habitat is based on the following rationales presented in the Assessment.

1. No in-water maintenance actions are proposed in occupied sturgeon habitat or designated critical habitat. Erosion control measures such as coir logs and sediment fences are expected to reduce sediment effects from out-of-water activities to an insignificant level.
2. The US Highway 95 bridge over the Kootenai River is the only location where Department roads are located adjacent to sturgeon habitat. All other maintenance locations will be greater than 400 yards from sturgeon habitat. Best Management Practices (BMPs) will reduce the effects from any bridge repair or maintenance activities to an insignificant level.
3. In-water work in tributaries to the Kootenai River may produce sediment with the potential to reach the river. However, sediment effects from these actions are expected to be insignificant due to the distance of these locations from the river.

1.3.2 Banbury Springs lanx

Service concurrence that the proposed Program is not likely to adversely affect the Banbury Springs lanx is based on the following rationales presented in the Assessment.

Effects to the Banbury Springs lanx from any Program actions are expected to be discountable because populations of the lanx are not likely to be located in proximity to any Department roads.

1.3.3 Bruneau hot springsnail

Service concurrence that the proposed Program is not likely to adversely affect the Brunneau hot spring snail is based on the following rationales presented in the Assessment.

Effects to the Bruneau hot springsnail from any Program actions are expected to be discountable because populations of the hot springsnail are not likely to be located in proximity to any Department roads.

1.3.4 Grizzly Bear

Service concurrence that the proposed Program is not likely to adversely affect the grizzly bear is based on the following rationales presented in the Assessment.

1. The Program will not result in any increase in roadways within grizzly bear habitat.
2. The Program will not affect any key food resources for the grizzly bear.
3. Although Program maintenance activities may disturb grizzly bears when conducted in bear habitat, all of the proposed actions are limited in scope and duration. As such, any effects to grizzly bears are expected to be insignificant.
4. Program actions will not result in any significant changes in habitat that would impact the grizzly bear.
5. Program actions will not have any effects on grizzly bear denning habitat.
6. All projects will be subject to existing BMPs designed to avoid or minimize adverse effects. In addition, all Program actions that occur within or adjacent to US Forest Service administered lands will be required to consult with the Forest Service concerning appropriate conservation measures that need to be administered during project construction activities in order to minimize impacts to grizzly bears.

1.3.5 Canada Lynx and Critical Habitat

Service concurrence that the proposed Program is not likely to adversely affect the Canada lynx and its critical habitat is based on the following rationales presented in the Assessment.

1. Because it is unlikely that lynx will occur in the immediate vicinity of any maintenance action, effects are expected to be discountable. In addition, adjacent suitable habitat is available for lynx to use to avoid any disturbance caused by project implementation.
2. If any lynx are present in the vicinity of maintenance actions, any effects are expected to be insignificant because the proposed actions will be spatially limited and of short duration.
3. Program actions are not expected to alter any lynx foraging or denning habitat or result in changes to lynx prey densities.
4. Designated lynx critical habitat does not exist in Idaho near any state or federal highways so construction, maintenance, and use of roads will not occur near critical habitat. Therefore, the Program will have no effect on critical habitat.

1.3.6 MacFarlane's four-o'clock

Service concurrence that the proposed Program is not likely to adversely affect MacFarlane's four-o'clock is based on the following rationales presented in the Assessment.

1. All Program activities will be evaluated by the Service.
2. Because MacFarlane's four-o'clock is associated with open, steep canyon grasslands (away from Department administered roadways) the risk of direct impacts from proposed

maintenance actions to the known MacFarlane's four-o'clock sites and its habitat is discountable.

3. When Program actions take place within suitable Macfarlane's four-o'clock habitat, species surveys will be conducted. The Department will avoid adverse effects to Macfarlane's four-o clock, or will initiate formal consultation separately for the specific action.

1.3.7 Water Howellia

Service concurrence that the proposed Program is not likely to adversely affect the water howellia is based on the following rationales presented in the Assessment.

1. All Program activities will be evaluated by the Service.
2. Water howellia is only known to occur in a few locations in Latah County. Known occurrences are on private land and are adequately buffered from adjacent state highway routes.
3. When activities take place within suitable habitat, species surveys will be conducted. Adverse effects to water howellia from highway construction or maintenance activities will be avoided.
4. Because water howellia habitat is coincident with wetlands and/or waters of the United States, road construction and maintenance would not be considered a primary threat to the species.

1.3.8 Ute ladies'- tresses

Service concurrence that the proposed Program is not likely to adversely affect the Ute ladies'-tresses is based on the following rationales presented in the Assessment.

1. All Program activities will be evaluated by the Service.
2. Virtually all known occurrences within Idaho are, or at one time were, associated with the Snake River floodplain in early to mid-seral riparian habitats not adjacent to Department administered roads. The risk of direct impacts from proposed maintenance actions to the known Utes ladies'-tresses sites and its habitat is discountable.
3. When activities take place within suitable habitat, species surveys will be conducted. The Department will avoid adverse effects to Ute ladies'-tresses, or will initiate formal consultation separately for the specific action.

1.3.9 Spalding's catchfly

Service concurrence that the proposed Program is not likely to adversely affect the Spalding's catchfly is based on the following rationales presented in the Assessment.

1. All Program activities will be evaluated by the Service.
2. The Department will use adaptive management practices for weed management along highway rights of way to avoid impacting Spalding's catchfly.

3. When activities take place within suitable habitat, species surveys will be conducted. The The Department will avoid adverse effects to Spalding's catchfly, or will initiate formal consultation separately for the specific action.

1.3.10 Slickspot peppergrass

Service concurrence that the proposed Program is not likely to adversely affect the slickspot peppergrass is based on the following rationales presented in the Assessment.

1. All Program activities will be evaluated by the Service.
2. The Department will use adaptive management practices for weed management along highway rights-of-way to avoid impacting the slickspot peppergrass.
3. When activities take place within suitable habitat, species surveys will be conducted. The Department will avoid adverse effects to Slickspot peppergrass, or will initiate formal consultation separately for the specific action.

BIOLOGICAL OPINION

2. DESCRIPTION OF THE PROPOSED ACTION

This section describes the proposed Federal action, including any measures that may avoid, minimize, or mitigate adverse effects to listed species or critical habitat, and the extent of the geographic area affected by the action (i.e., the action area). The term "action" is defined in the implementing regulations for section 7 as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." The term "action area" is defined in the regulations as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

2.1 Action Area

Description of the Action Area

The action area identified in the Assessment includes 71 subbasins (fourth-level hydrological units) that encompass all areas potentially affected directly or indirectly by the Program (Table 1).

Table 1. Fourth Level Hydrologic Units (HUCs) comprising the Program action area.

HUC. (4th level)	□ubbasin Name	HUC (4th level)	Subbasin Name
Kootenai		Snake River Basin (continued)	
17010101	Upper Kootenai	17040105	Salt
17010104	Lower Kootenai	17040201	Idaho Falls
17010105	Moyie	17040202	Upper Henry's
Pend Oreille		17040203	Lower Henry's
17010213	Lower Clark Fork	17040204	Teton
17010214	Pend Oreille Lake	17040205	Willow
17010215	Priest	17040206	American Falls
17010216	Pend Oreille	17040207	Blackfoot
Coeur d'Alene		17040208	Portneuf
17010301	Upper Coeur d'Alene	17040209	Lake Walcott
17010302	South Fork Coeur d'Alene	17040210	Raft River
17010303	Coeur d'Alene Lake	17040211	Goose Creek
17010304	St. Joe	17040212	Billingsley Creek
17010305	Upper Spokane	17040213	Salmon Falls Creek
17010306	Hangman	17040214	Beaver-Camas
17010308	Little Spokane	17040215	Medicine Lodge
Clearwater Basin		17040216	Birch
17060301	Upper Selway	17040217	Little Lost
17060302	Lower Selway	17040218	Big Lost
17060303	Lochsa	17040212 /	Middle Snake River
17060304	Middle Fork Clearwater	17040213	
17060305	South Fork Clearwater	17040219	Big Wood River
17060306	Clearwater	17040220	Camas Creek
Salmon River Basin		17040221	Little Wood River
17060201	Upper Salmon	17040212	Upper Snake Rock
17060202	Pahsimeroi	17050101	King Hill to C.J. Strike Reservoir
17060203	Middle Salmon-Panther	17050102	Bruneau River
17060204	Lemhi	17050103	Mid Snake River
17060205	Upper Middle Fork Salmon	17060101/	Snake River – Hells Canyon
17060206	Lower Middle Fork Salmon	17050103/	
17060207	Middle Salmon-Chamberlain	17050115/	
17060208	South Fork Salmon River	17050201	
17060209	Lower Salmon	17050124	Weiser River
17060210	Little Salmon River	17050114	Lower Boise River
17060101	Hells Canyon	17050122	Payette River
17060103	Lower Snake River	17050123	Payette River-North Fork
Snake River Basin		17050120	Payette River-South Fork
17040104	Palisades	17050112	Boise-Mores Creek

2.2 Proposed Action

2.2.1 Program Procedures

The proposed Program includes routine actions performed by the six Department Districts within the state of Idaho via a federal nexus with the FHWA and/or the COE. Please note however that during the first year of implementation, only Districts 2, 4, and 6 will use the Program on a test basis. If use of the Program by these three Districts is successful, use of the Program will be extended to all six Department Districts for the remainder of the five-year implementation period.

The federal nexus may result from either federal funding of the project through the FHWA or from a federal permit action undertaken by the COE.

As lead agency for federal aid project actions involving highway projects, the FHWA is responsible for compliance with section 7 of the Act. In accordance with implementing these regulations, including 50 CFR 402.08, the FHWA has delegated authority to the Department for preparation of biological evaluations and biological assessments, and to conduct informal consultation with the Services. The delegation of this authority was established via a separate Memorandum of Understanding (MOU), "Procedures Relating to Section 7 of the Endangered Species Act and Transportation Projects in Idaho," between the ITD, FHWA, and the Services dated Feb. 28, 2003 (see appendix of Assessment).

The COE is responsible for ensuring compliance with section 7 of the Act for projects that require Department of the Army permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act of 1899. The COE is the lead federal agency for state-funded projects that require a Department of the Army (DA) permit. The COE has also designated the Department as a non-federal representative for section 7 actions covered under this Program.

The process and procedures established under the 2003 MOU for formal and informal consultation and for "no effect" documentation remain in effect, and shall be implemented with this Program. When there is no federal nexus, either as a result of use of federal funds, federal permits or other means, this Program does not apply.

Program activities described in the Assessment are constructed by state forces or federal aid project contractors and subcontractors on a recurring basis. In most cases, what is described is a typical sequence for conducting the action. Any project deviation with effects measurably different from those evaluated in this document will not be covered under the Program. Multiple types of projects may be approved as components of one proposed action. For example, a passing-lane construction project might also include bank stabilization and a culvert replacement. In these cases, the most restrictive best management practices (BMPs) from any one of the individual project types shall apply to the proposed action in its entirety.

PROCESS

The process the Department will follow while using the Program includes the following (excerpted from the Assessment with minor changes added for clarification and/or consistency).

Confirm Listed Species

The Department will confirm that each action authorized or carried out under the Program will occur within the present or historical range of a listed species, designated or proposed critical habitat, or designated essential fish habitat.

Department Review

The Department will individually review each action to ensure that all effects to listed species and their proposed or designated critical habitats are within the range of effects considered in the Assessment. The Department will determine if the action has a FHWA or COE federal nexus; if so, the Department will follow the process outlined in the Assessment.

NMFS/FWS/COE/FHWA Review

The Department will ensure that all actions described within the Assessment will be individually reviewed and confirmed by the Services that the actions meet Program requirements. In addition:

- The COE will receive project Pre-notification forms for all actions requiring a DA permit.
- FHWA will receive project Pre-notification forms for all federal aid actions.

Notification

a. The Department will initiate the Services' review of all Not Likely to Adversely Affect (NLAA) Program projects by submitting the Project Pre-Notification Form to the Services with sufficient detail about the action design and construction to ensure the proposed action is consistent with all provisions of the Program. The Services will notify the Department within 30 calendar days either confirming that the action meets the provisions of the Program or is disqualified.

b. The FHWA or the COE will initiate the Services' review of all Likely to Adversely Affect (LAA) projects by submitting the action notification form to the Services with sufficient detail about the action design and construction to ensure the proposed action is consistent with all provisions of the Program. The Services will notify FHWA/COE within 30 calendar days either confirming that the project meets the provisions of the Program or is disqualified. Notifications of NLAA and LAA project effects and responses to those by the Services may be made by electronic submission.

Site Access

The Department will retain the right of access to sites on which authorized actions will be implemented in order to monitor the use and effectiveness of permit conditions. The Services will be allowed access to project sites as requested.

Salvage Notice

If a sick, injured or dead specimen of a threatened or endangered species is found, the Department must notify NMFS (208-321-2956) or the Service (208-378-5333) Office of Law Enforcement. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility for carrying out instructions provided by the Office of Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

Project Monitoring Forms

Within 45 days of project completion, the Department will send the appropriate post-project monitoring forms to the Services.

Annual Coordination Meeting

The Department will coordinate and host an annual meeting to review the projects conducted under the Program during the previous year.

Failure to Provide Reporting May Trigger Reinitiation

If the Department fails to provide notification of actions for the Services' review, project monitoring reports, or fails to organize the annual coordination meeting, the Services may assume the action has been modified in a way that constitutes a modification of the proposed action in a manner and to an extent not previously considered, and may recommend reinitiation of this consultation.

Audits

The Department, the Services, FHWA and the COE may conduct periodic reviews or audits on the use of the Program. As referenced above, the Department shall allow the Services, FHWA, or the COE the opportunity to review any actions while in progress or after completion. The purpose of this review is to ensure clearance of appropriate project types and Best Management Practices (BMPs) effectiveness.

Training

The Department HQ office will provide an annual training opportunity for districts that wish to use this Program.

Reinitiation

If the Department chooses to continue programmatic coverage under this document, the Department will reinitiate consultation within 5 years of the date of issuance.

2.2.2 Program Actions

Table 2 shows the types of maintenance actions covered under the Program and the expected effects determinations on applicable listed species. Refer to the Assessment for details on each of these activities, including activity-specific BMPs.

Table 2. Program activities grouped by effect determinations for listed species.

Not Likely to Adversely Affect Projects	Likely to Adversely Affect Projects
Seal Coats, Tack Coat, Prime Coat	2-Lane Bridge Construction – (Over Water)
Plant Mix Overlay	Bank Stabilization (Riprap) – Stream Channel
CRABS (Cement Recycled Asphalt Base Stailization)	Bank Stabilization (Gabion Basket) – Stream Channel
CIR (Cold In-Place Recycle)	Culvert Installation – Perennial Stream
Bridge Deck Hydro-Demolition	
Silica Fume and Latex Modified Concrete Overly	Culvert Maintenance – Perennial Stream
High Molecular Weight Methacrylate Seal (HMWM)	Culvert Extension – Perennial Stream
Concrete Waterproof Systems (Membrane Type A,B,C and D)	Geotechnical Drilling
Bridge Deck Epoxy Seal	Small Structure Repair
2-Lane Bridge Construction (Upland)	Note: For aquatic species all LAA projects assume in-water work and issuance of COE, IDWR and DEQ permits. For the northern Idaho ground squirrel (NIDGS) any of the Program actions may have adverse effects if conducted in occupied NIDGS habitat.
Excavation and Embankment for Roadway Construction (Earthwork)	
Rock Scaling	
Passing Lanes, Turnbays and Slow Moving Vehicle Turnouts (Wide Shoulder Notch)	
Pavement Widening (Sliver Shoulder Notch)	
Bank Stabilization (Riprap) – Upland	
Bank Stabilization (Gabion Basket) – Upland	
Mechanically Stabilized Earth Embankment (MSE Wall)	
Ditch Cleaning	
Culvert Installation – Seasonal Stream	
Culvert Extension – Seasonal Stream	
Culvert Maintenance – Seasonal Stream	
Guardrail Installation	
Striping (methl methacrylate or paint)	

2.2.3 Best Management Practices (BMPs) and Mitigations Common to all Program Activities

The following BMPs will be used to minimize resource impacts during implementation of Program activities.

- All associated permit conditions (e.g., from the Idaho Department of Water Resources, or COE 404, etc.) will be met during construction operations.
- Idaho State Water Quality Standards will be met during construction operations.
- The Idaho Department of Fish and Game (IDFG) will be consulted for appropriate fish windows on a project-by-project basis and prior to all in-water work. IDFG fish windows will be adhered to during project implementation.
- Fiber wattles and/or silt fence will be placed adjacent to or below disturbance areas to prevent/minimize sediment transport into any waterway.
- Equipment used shall not have damaged hoses, fittings, lines, or tanks that have the potential to release pollutants into any waterway.
- Cofferdams or other isolation methods will be used when practicable to dewater the project area during in-water work.
- To minimize the potential for direct impacts to listed fish, when possible, all work will be completed from the existing bridge or roadway shoulder and equipment and/or heavy machinery will not enter the river channel.
- To minimize the potential for introducing hazardous material to the aquatic system, a spill prevention and control countermeasures plan will be prepared by the construction contractor and approved by the Department prior to Project implementation. All staging, fueling, and storage areas will be located away and adequately buffered from riparian zones and aquatic areas.
- When appropriate, the Department will monitor turbidity. Water quality samples will be collected and NTU measurements will be recorded on the Construction Monitoring form. Measurements will be taken 100 feet above and below discharge points, or as directed by appropriate resource agency or Department personnel.
- No bridge rehabilitation activities will occur during wet weather conditions.
- Disturbed areas within riparian zones will be reclaimed with riparian vegetation similar to the existing plant communities. (The Service assumes that this refers to existing native plant communities only.)
- Spill kits and cleanup materials shall be available at all locations during operations.
- Equipment that is used adjacent to or over water bodies shall be kept leak-free.
- Park equipment over plastic sheeting or equivalent where possible. Plastic is not a substitute for drip pans or absorbent pads.
- When not in use, construction equipment will be stored away from concentrated flows of stormwater, drainage courses, and inlets.
- Hydraulic equipment will be protected from runon and runoff by placing them on plywood and covering them with plastic or a comparable material prior to the onset of rain.

- Borrow and fill areas shall be located outside of the 100 year floodplain or greater than 300 feet from fish-bearing streams.
- To reduce the potential for the invasion and/or expansion of noxious weeds, all earth-disturbing equipment used on projects with contracts administered by the Department shall be cleaned of all plant materials, dirt and material that may carry noxious weed seeds prior to use on the project.
- Construction equipment shall be washed and treated to remove seeds, plants, and plant fragments. Use of a high pressure washing system is recommended in order to remove all seeds, plants, plant fragments dirt, and debris from the construction equipment taking care to wash the sides, tops, and undercarriages. (The Service assumes that equipment cleaning will occur at an approved site located away from the construction site.)
- The Contractor shall provide the Engineer with an opportunity to inspect the equipment prior to unloading the equipment at the construction site. If upon inspection, dirt, debris, and seeds are visible, the equipment shall be immediately removed and rewashed. The equipment shall then be re-inspected at the site to ensure the equipment is clean.

2.2.4 BMPs Associated with the Preservation and Retention of Existing Vegetation

GENERAL DESCRIPTION
Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs and/or grasses that serve as erosion controls.

APPLICATIONS
These techniques are applicable to all types of sites. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.

INSTALLATION/APPLICATION CRITERIA

- Clearly mark, flag or fence vegetation or areas where vegetation should be preserved.
- Prepare landscaping plans which include as much existing vegetation as possible and state proper care during and after construction.
- Using berms, fencing, signs, etc., define and protect a setback area from vegetation to be preserved.
- Propose landscaping plans which include and utilize native plant species that minimize competition with the existing vegetation.
- Do not locate construction staging areas, waste areas, etc. where significant adverse impact on existing vegetation may occur.
- Establish appropriate buffer zones to protect riparian corridors and natural drainage paths; maintain and protect dense vegetation in these areas and retain vegetated buffers in their natural state wherever possible
- Minimize the number and width of stream crossings and cross at direct, rather than oblique, angles.

- Maximize undisturbed area within project boundaries whenever possible to retain vegetation for erosion control purposes.
- Preserve native site vegetation and plant communities when practicable. Choose native vegetation when applicable for revegetation efforts.

3. ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

3.1 Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this Biological Opinion relies on four components: (1) the *Status of the Species*, which evaluates a listed species' rangewide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of a species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the species' current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The jeopardy analysis in this Biological Opinion places an emphasis on consideration of the rangewide survival and recovery needs of the species and the role of the action area in the survival and recovery of the species as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

3.2 Adverse Modification Determination

This Biological Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this Biological Opinion relies on four components: (1) the *Status of Critical Habitat*, which evaluates the rangewide condition of designated critical habitat for the species in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the species' critical habitat are evaluated in the context of the rangewide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat rangewide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the species.

The analysis in this Biological Opinion places an emphasis on using the intended rangewide recovery function of the species' critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

4. BULL TROUT

4.1 Status of the Species and Designated/Proposed Critical Habitat

This section presents information about the regulatory, biological and ecological status of the species that provides context for evaluating the significance of probable effects caused by the proposed action.

4.1.1 Listing Status

The coterminous United States population of the bull trout was listed as threatened on November 1, 1999 (64 FR 58910). The threatened bull trout occurs in the Klamath River Basin of south-central Oregon, the Jarbidge River in Nevada, north to various coastal rivers of Washington to the Puget Sound, east throughout major rivers within the Columbia River Basin to the St. Mary-Belly River, and east of the Continental Divide in northwestern Montana (Cavender 1978, pp. 165-166; Bond 1992, p. 4; Brewin and Brewin 1997, pp. 209-216; Leary and Allendorf 1997, pp. 715-720). The Service completed a 5-year Review in 2008 and concluded that the bull trout should remain listed as threatened (Fish and Wildlife Service 2008, p. 53).

The bull trout was initially listed as three Distinct Population Segments (DPSs) (63 FR 31647, 64 FR 17110). The preamble to the final listing rule for the United States coterminous population of the bull trout discusses the consolidation of these DPSs, plus two other population segments, into one listed taxon and the application of the jeopardy standard under section 7 of the Act relative to this species (64 FR 58930):

"Although this rule consolidates the five bull trout DPSs into one listed taxon, based on conformance with the DPS policy for purposes of consultation under section 7 of the Act, we intend to retain recognition of each DPS in light of available scientific information relating to their uniqueness and significance. Under this approach, these DPSs will be treated as interim recovery units with respect to application of the jeopardy standard until an approved recovery plan is developed. Formal establishment of bull trout recovery units will occur during the recovery planning process."

Please note that consideration of the above recovery units for purposes of the jeopardy analysis is done within the context of making the jeopardy determination at the scale of the entire listed species in accordance with Service policy (Fish and Wildlife Service 2006, pp. 1-2).

4.1.2 Reasons for Listing

Though wide ranging in parts of Oregon, Washington, Idaho, and Montana, bull trout in the interior Columbia River basin presently occur in only about 45 percent of the historical range (Quigley and Arbelbide 1997, p. 1177; Rieman et al. 1997, p. 1119). Declining trends due to the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest and poaching, entrainment into diversion channels and dams, and introduced non-native species (e.g., brook trout, *Salvelinus fontinalis*) have resulted in declines in range-wide bull trout distribution and abundance (Bond 1992, p. 4; Schill 1992, p. 40; Thomas 1992, pp. 9-12; Ziller 1992, p. 28; Rieman and McIntyre 1993, pp. 1-18; Newton and Pribyl 1994, pp. 2, 4, 8-9; Idaho Department of Fish and Game in litt. 1995, pp. 1-3). Several local extirpations have been reported, beginning in the 1950s (Rode 1990, p. 1; Ratliff and Howell 1992, pp. 12-14; Donald and Alger 1993, p. 245; Goetz 1994, p. 1; Newton and Pribyl 1994, p. 2; Berg and Priest 1995, pp. 1-45; Light et al. 1996, pp. 20-38; Buchanan and Gregory 1997, p. 120).

Land and water management activities such as dams and other diversion structures, forest management practices, livestock grazing, agriculture, road construction and maintenance, mining, and urban and rural development continue to degrade bull trout habitat and depress bull trout populations (Fish and Wildlife Service 2002a, p. 13).

4.1.3 Species Description

Bull trout (*Salvelinus confluentus*), member of the family Salmonidae, are char native to the Pacific Northwest and western Canada. The bull trout and the closely related Dolly Varden (*Salvelinus malma*) were not officially recognized as separate species until 1980 (Robins et al. 1980, p. 19). Bull trout historically occurred in major river drainages in the Pacific Northwest from the southern limits in the McCloud River in northern California (now extirpated), Klamath River basin of south central Oregon, and the Jarbidge River in Nevada to the headwaters of the Yukon River in the Northwest Territories, Canada (Cavender 1978, p. 165-169; Bond 1992, p. 2-3). To the west, the bull trout's current range includes Puget Sound, coastal rivers of British Columbia, Canada, and southeast Alaska (Bond 1992, p. 2-3). East of the Continental Divide bull trout are found in the headwaters of the Saskatchewan River in Alberta and the MacKenzie River system in Alberta and British Columbia (Cavender 1978, p. 165-169; Brewin and Brewin 1997, pp. 209-216). Bull trout are wide spread throughout the Columbia River basin, including its headwaters in Montana and Canada.

4.1.4 Life History

Bull trout exhibit resident and migratory life history strategies throughout much of the current range (Rieman and McIntyre 1993, p. 2). Resident bull trout complete their entire life cycle in the streams where they spawn and rear. Migratory bull trout spawn and rear in streams for one to four years before migrating to either a lake (adfluvial), river (fluvial), or, in certain coastal areas, to saltwater (anadromous) where they reach maturity (Fraley and Shepard 1989, p. 1;

Goetz 1989, pp. 15-16). Resident and migratory forms often occur together and it is suspected that individual bull trout may give rise to offspring exhibiting both resident and migratory behavior (Rieman and McIntyre 1993, p. 2).

Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993, p. 4). Watson and Hillman (1997, p. 248) concluded that watersheds must have specific physical characteristics to provide habitat requirements for bull trout to successfully spawn and rear. It was also concluded that these characteristics are not necessarily ubiquitous throughout these watersheds resulting in patchy distributions even in pristine habitats.

Bull trout are found primarily in colder streams, although individual fish are migratory in larger, warmer river systems throughout the range (Fraley and Shepard 1989, pp. 135-137; Rieman and McIntyre 1993, p. 2 and 1995, p. 288; Buchanan and Gregory 1997, pp. 121-122; Rieman et al. 1997, p. 1114). Water temperature above 15°C (59°F) is believed to limit bull trout distribution, which may partially explain the patchy distribution within a watershed (Fraley and Shepard 1989, p. 133; Rieman and McIntyre 1995, pp. 255-296). Spawning areas are often associated with cold water springs, groundwater infiltration, and the coldest streams in a given watershed (Pratt 1992, p. 6; Rieman and McIntyre 1993, p. 7; Rieman et al. 1997, p. 1117). Goetz (1989, pp. 22, 24) suggested optimum water temperatures for rearing of less than 10°C (50°F) and optimum water temperatures for egg incubation of 2 to 4°C (35 to 39°F).

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Goetz 1989, pp. 22-25; Pratt 1992, p. 6; Thomas 1992, pp. 4-5; Rich 1996, pp. 35-38; Sexauer and James 1997, pp. 367-369; Watson and Hillman 1997, pp. 247-249). Jakober (1995, p. 42) observed bull trout overwintering in deep beaver ponds or pools containing large woody debris in the Bitterroot River drainage, Montana, and suggested that suitable winter habitat may be more restrictive than summer habitat. Bull trout prefer relatively stable channel and water flow conditions (Rieman and McIntyre 1993, p. 6). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997, pp. 368-369).

The size and age of bull trout at maturity depend upon life history strategy. Growth of resident fish is generally slower than migratory fish; resident fish tend to be smaller at maturity and less fecund (Goetz 1989, p. 15). Bull trout normally reach sexual maturity in 4 to 7 years and live as long as 12 years. Bull trout are iteroparous (they spawn more than once in a lifetime), and both repeat- and alternate-year spawning has been reported, although repeat-spawning frequency and post-spawning mortality are not well documented (Leathe and Graham 1982, p. 95; Fraley and Shepard 1989, p. 135; Pratt 1992, p. 8; Rieman and McIntyre 1996, p. 133).

Bull trout typically spawn from August to November during periods of decreasing water temperatures. Migratory bull trout frequently begin spawning migrations as early as April, and have been known to move upstream as far as 250 kilometers (km) (155 miles (mi)) to spawning grounds (Fraley and Shepard 1989, p. 135). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992, p.1) and, after hatching, juveniles remain in the substrate. Time from egg deposition to emergence may exceed 200 days. Fry normally emerge from early April through May depending upon water temperatures and increasing stream flows (Pratt 1992, p. 1).

The iteroparous reproductive system of bull trout has important repercussions for the management of this species. Bull trout require two-way passage up and downstream, not only for repeat spawning, but also for foraging. Most fish ladders, however, were designed specifically for anadromous semelparous (fishes that spawn once and then die, and therefore require only one-way passage upstream) salmonids. Therefore, even dams or other barriers with fish passage facilities may be a factor in isolating bull trout populations if they do not provide a downstream passage route.

Bull trout are opportunistic feeders with food habits primarily a function of size and life history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macro zooplankton and small fish (Boag 1987, p. 58; Goetz 1989, pp. 33-34; Donald and Alger 1993, pp. 239-243). Adult migratory bull trout are primarily piscivores, known to feed on various fish species (Fraley and Shepard 1989, p. 135; Donald and Alger 1993, p. 242).

4.1.5 Population Dynamics

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, pp. 47-48) defined core areas as groups of partially isolated local populations of bull trout with some degree of gene flow occurring between them. Based on this definition, core areas can be considered metapopulations. A metapopulation is an interacting network of local populations with varying frequencies of migration and gene flow among them (Meefe and Carroll 1994, p. 188). In theory, bull trout metapopulations (core areas) can be composed of two or more local populations, but Rieman and Allendorf (2001, p. 763) suggest that for a bull trout metapopulation to function effectively, a minimum 10 local populations are required. Bull trout core areas with fewer than five local populations are at increased risk of local extirpation, core areas with between five and 10 local populations are at intermediate risk, and core areas with more than 10 interconnected local populations are at diminished risk (Fish and Wildlife Service 2002a, pp. 50-51).

The presence of a sufficient number of adult spawners is necessary to ensure persistence of bull trout populations. In order to avoid inbreeding depression, it is estimated that a minimum of 100 spawners are required. Inbreeding can result in increased homozygosity of deleterious recessive alleles which can in turn reduce individual fitness and population viability (Whitesel et al. 2004, p. 36). For persistence in the longer term, adult spawning fish are required in sufficient numbers to reduce the deleterious effects of genetic drift and maintain genetic variation. For bull trout, Rieman and Allendorf (2001, p. 762) estimate that approximately 1,000 spawning adults within any bull trout population are necessary for maintaining genetic variation indefinitely. Many local bull trout populations individually do not support 1,000 spawners, but this threshold may be met by the presence of smaller interconnected local populations within a core area.

For bull trout populations to remain viable (and recover), natural productivity should be sufficient for the populations to replace themselves from generation to generation. A population that consistently fails to replace itself is at an increased risk of extinction. Since estimates of population size are rarely available, the productivity or population growth rate is usually estimated from temporal trends in indices of abundance at a particular life stage. For example, redd counts are often used as an indicator of a spawning adult population. The direction and magnitude of a trend in an index can be used as a surrogate for growth rate.

Survival of bull trout populations is also dependent upon connectivity among local populations. Although bull trout are widely distributed over a large geographic area, they exhibit a patchy distribution even in pristine habitats (Rieman and McIntyre 1993, p. 7). Increased habitat fragmentation reduces the amount of available habitat and increases isolation from other populations of the same species (Saunders et al. 1991, p. 22). Burkey (1989, p. 76) concluded that when species are isolated by fragmented habitats, low rates of population growth are typical in local populations and their probability of extinction is directly related to the degree of isolation and fragmentation. Without sufficient immigration, growth of local populations may be low and probability of extinction high. Migrations also facilitate gene flow among local populations because individuals from different local populations interbreed when some stray and return to non natal streams. Local populations that are extirpated by catastrophic events may also become reestablished in this manner.

In summary, based on the works of Rieman and McIntyre (1993, pp. 9-15) and Rieman and Allendorf (2001, pp 756-763), the draft bull trout Recovery Plan identified four elements to consider when assessing long-term viability (extinction risk) of bull trout populations: (1) number of local populations, (2) adult abundance (defined as the number of spawning fish present in a core area in a given year), (3) productivity, or the reproductive rate of the population, and (4) connectivity (as represented by the migratory life history form).

4.1.6 Status and Distribution

As noted above, in recognition of available scientific information relating to their uniqueness and significance, five population segments of the coterminous United States population of the bull trout are considered essential to the survival and recovery of this species and are identified as: (1) Jarbidge River, (2) Klamath River, (3) Coastal-Puget Sound, (4) St. Mary-Belly River, and (5) Columbia River. Each of these segments is necessary to maintain the bull trout's distribution, as well as its genetic and phenotypic diversity, all of which are important to ensure the species' resilience to changing environmental conditions.

A summary of the current status and conservation needs of the bull trout within these units is provided below. A comprehensive discussion of these topics is found in the draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, entire; 2004a, b; entire).

Central to the survival and recovery of the bull trout is the maintenance of viable core areas (Fish and Wildlife Service 2002a, p. 54). A core area is defined as a geographic area occupied by one or more local bull trout populations that overlap in their use of rearing, foraging, migratory, and overwintering habitat, and in some cases their use of spawning habitat. Each of the population segments listed below consists of one or more core areas. One hundred and twenty one core areas are recognized across the United States range of the bull trout (Fish and Wildlife Service 2005, p. 9).

A core area assessment conducted by the Service for the five year bull trout status review determined that of the 121 core areas comprising the coterminous listing, 43 are at high risk of extirpation, 44 are at risk, 28 are at potential risk, four are at low risk and two are of unknown status (Fish and Wildlife Service 2008, p. 29).

4.1.6.1 Jarbidge River

This population segment currently contains a single core area with six local populations. Less than 500 resident and migratory adult bull trout, representing about 50 to 125 spawners, are estimated to occur within the core area. The current condition of the bull trout in this segment is attributed to the effects of livestock grazing, roads, angler harvest, timber harvest, and the introduction of non-native fishes (Fish and Wildlife Service 2004a, p. iii). The draft bull trout

Recovery Plan identifies the following conservation needs for this segment: (1) maintain the current distribution of the bull trout within the core area, (2) maintain stable or increasing trends in abundance of both resident and migratory bull trout in the core area, (3) restore and maintain suitable habitat conditions for all life history stages and forms, and (4) conserve genetic diversity and increase natural opportunities for genetic exchange between resident and migratory forms of the bull trout. An estimated 270 to 1,000 spawning fish per year are needed to provide for the persistence and viability of the core area and to support both resident and migratory adult bull trout (Fish and Wildlife Service 2004a, p. 62-63). Currently this core area is at high risk of extirpation (Fish and Wildlife Service 2005, p. 9).

4.1.6.2 Klamath River

This population segment currently contains three core areas and 12 local populations. The current abundance, distribution, and range of the bull trout in the Klamath River Basin are greatly reduced from historical levels due to habitat loss and degradation caused by reduced water quality, timber harvest, livestock grazing, water diversions, roads, and the introduction of non-native fishes. Bull trout populations in this unit face a high risk of extirpation (Fish and Wildlife Service 2002b, p. iv). The draft bull trout Recovery Plan (Fish and Wildlife Service 2002b, p. v) identifies the following conservation needs for this unit: (1) maintain the current distribution of the bull trout and restore distribution in previously occupied areas, (2) maintain stable or increasing trends in bull trout abundance, (3) restore and maintain suitable habitat conditions for all life history stages and strategies, and (4) conserve genetic diversity and provide the opportunity for genetic exchange among appropriate core area populations. Eight to 15 new local populations and an increase in population size from about 3,250 adults currently to 8,250 adults are needed to provide for the persistence and viability of the three core areas (Fish and Wildlife Service 2002b, p. vi).

4.1.6.3 Coastal-Puget Sound

Bull trout in the Coastal-Puget Sound population segment exhibit anadromous, adfluvial, fluvial, and resident life history patterns. The anadromous life history form is unique to this unit. This population segment currently contains 14 core areas and 67 local populations (Fish and Wildlife Service 2004b, p. iv; 2004c, pp. iii-iv). Bull trout are distributed throughout most of the large rivers and associated tributary systems within this unit. With limited exceptions, bull trout continue to be present in nearly all major watersheds where they likely occurred historically within this unit. Generally, bull trout distribution has contracted and abundance has declined, especially in the southeastern part of the unit. The current condition of the bull trout in this population segment is attributed to the adverse effects of dams, forest management practices (e.g., timber harvest and associated road building activities), agricultural practices (e.g., diking, water control structures, draining of wetlands, channelization, and the removal of riparian vegetation), livestock grazing, roads, mining, urbanization, angler harvest, and the introduction of non-native species. The draft bull trout Recovery Plan (Fish and Wildlife Service 2004b, pp. ix-x) identifies the following conservation needs for this unit: (1) maintain or expand the current distribution of bull trout within existing core areas, (2) increase bull trout abundance to about 16,500 adults across all core areas, and (3) maintain or increase connectivity between local populations within each core area.

4.1.6.4 St. Mary-Belly River

This population segment currently contains six core areas and nine local populations (Fish and Wildlife Service 2002c, p. v). Currently, bull trout are widely distributed in the St. Mary River drainage and occur in nearly all of the waters that were inhabited historically. Bull trout are found only in a 1.2-mile reach of the North Fork Belly River within the United States. Redd count surveys of the North Fork Belly River documented an increase from 27 redds in 1995 to 119 redds in 1999. This increase was attributed primarily to protection from angler harvest (Fish and Wildlife Service 2002c, p. 37). The current condition of the bull trout in this population segment is primarily attributed to the effects of dams, water diversions, roads, mining, and the introduction of non-native fishes (Fish and Wildlife Service 2002c, p. vi). The draft bull trout Recovery Plan (Fish and Wildlife Service 2002c, pp. v-ix) identifies the following conservation needs for this unit: (1) maintain the current distribution of the bull trout and restore distribution in previously occupied areas, (2) maintain stable or increasing trends in bull trout abundance, (3) maintain and restore suitable habitat conditions for all life history stages and forms, (4) conserve genetic diversity and provide the opportunity for genetic exchange, and (5) establish good working relations with Canadian interests because local bull trout populations in this unit are comprised mostly of migratory fish whose habitat is mainly in Canada.

4.1.6.5 Columbia River

The Columbia River population segment includes bull trout residing in portions of Oregon, Washington, Idaho, and Montana. Bull trout are estimated to have occupied about 60 percent of the Columbia River Basin, and presently occur in 45 percent of the estimated historical range (Quigley and Arbelbide 1997, p. 1177). This population segment currently contains 97 core areas and 527 local populations. About 65 percent of these core areas and local populations occur in Idaho and northwestern Montana.

The condition of the bull trout populations within these core areas varies from poor to good, but generally all have been subject to the combined effects of habitat degradation, fragmentation and alterations associated with one or more of the following activities: dewatering, road construction and maintenance, mining and grazing, blockage of migratory corridors by dams or other diversion structures, poor water quality, incidental angler harvest, entrainment into diversion channels, and introduced non-native species.

The Service has determined that of the total 97 core areas in this population segment, 38 are at high risk of extirpation, 35 are at risk, 20 are at potential risk, two are at low risk, and two are at unknown risk (Fish and Wildlife Service 2005, pp. 1-94).

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, p. v) identifies the following conservation needs for this population segment: (1) maintain or expand the current distribution of the bull trout within core areas, (2) maintain stable or increasing trends in bull trout abundance, (3) maintain and restore suitable habitat conditions for all bull trout life history stages and strategies, and (4) conserve genetic diversity and provide opportunities for genetic exchange.

<u>4.1.6.5.1 Columbia River Recovery/Management Units</u>

Achieving recovery goals within each management unit is critical to recovering the Columbia River population segment. Recovering bull trout in each management unit would maintain the overall distribution of bull trout in their native range. Individual core areas are the foundation of management units and conserving core areas and their habitats within management units preserves the genotypic and phenotypic diversity that will allow bull trout access to diverse habitats and reduce the risk of extinction from stochastic events. The continued survival and recovery of each individual core area is critical to the persistence of management units and their role in the recovery of a population segment (Fish and Wildlife Service 2002a, p. 54).

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, p. 2) identified 22 recovery units within the Columbia River population segment. These units are now referred to as management units. Management units are groupings of bull trout with historical or current gene flow within them and were designated to place the scope of bull trout recovery on smaller spatial scales than the larger population segments. The action area is encompassed by the Kootenai River, Clark Fork, Coeur d'Alene, Clearwater, Imnaha-Snake, Hells Canyon, and Southwest Idaho management units.

4.1.7 Previous Consultations and Conservation Efforts

4.1.7.1 Consultations

Consulted-on effects are those effects that have been analyzed through section 7 consultation as reported in a biological opinion. These effects are an important component of objectively characterizing the current condition of the species. To assess consulted-on effects to bull trout, we analyzed all of the biological opinions received by the Region 1 and Region 6 Service Offices, from the time of listing until August 2003; this summed to 137 biological opinions. Of these, 124 biological opinions (91 percent) applied to activities affecting bull trout in the Columbia Basin population segment, 12 biological opinions (9 percent) applied to activities affecting bull trout in the Coastal-Puget Sound population segment, 7 biological opinions (5 percent) applied to activities affecting bull trout in the Klamath Basin population segment, and one biological opinion (< 1 percent) applied to activities affecting the Jarbidge and St. Mary-Belly population segments (Note: these percentages do not add to 100, because several biological opinions applied to more than one population segment). The geographic scale of these consultations varied from individual actions (e.g., construction of a bridge or pipeline) within one basin to multiple-project actions occurring across several basins.

Our analysis showed that we consulted on a wide array of actions which had varying levels of effect. Many of the actions resulted in only short-term adverse effects – some with long-term beneficial effects. Some of the actions resulted in long-term adverse effects. No actions that have undergone consultation were found to appreciably reduce the likelihood of survival and recovery of the bull trout. Furthermore, no actions that have undergone consultation were anticipated to result in the loss of local populations of bull trout.

4.1.7.2 Regulatory mechanisms

The implementation and effectiveness of regulatory mechanisms vary across the coterminous range. Forest practices rules for Montana, Idaho, Oregon, Washington, and Nevada include streamside management zones that benefit bull trout when implemented.

4.1.7.3 State Conservation Measures

State agencies are specifically addressing bull trout through:

- Washington Bull Trout and Dolly Varden Management Plan developed in 2000.

- Montana Bull Trout Restoration Plan (Bull Trout Restoration Team appointed in
- 1994, and plan completed in 2000).
- Oregon Native Fish Conservation Policy (developed in 2004).
- Nevada Species Management Plan for Bull Trout (developed in 2005).
- State of Idaho Bull Trout Conservation Plan (developed in 1996); the watershed advisory group drafted 21 problem assessments throughout Idaho, which address all 59 key watersheds. To date, a conservation plan has been completed for one of the 21 key watersheds (Pend Oreille).

4.1.7.4 Habitat Conservation Plans

Habitat Conservation Plans (HCP) have resulted in land management practices that exceed State regulatory requirements. Habitat conservation plans addressing bull trout cover approximately 472 stream miles of aquatic habitat, or approximately 2.6 percent of the Key Recovery Habitat across Montana, Oregon, Washington, Nevada, and Idaho. These HCPs include: Plum Creek Native Fish HCP, Washington Department of Natural Resources HCP, City of Seattle Cedar River Watershed HCP, Tacoma Water HCP, and Green Diamond HCP.

4.1.7.5 Federal Land Management Plans

PACFISH is the Interim Strategy for Managing Anadromous Fish-Producing Watersheds and includes Federal lands in Western Oregon and Washington, Idaho, and Portions of California. INFISH is the "Interim Strategy for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada." Each strategy amended Forest Service Land and Resource Management Plans and Bureau of Land Management Resource Management Plans. Together PACFISH and INFISH cover thousands of miles of waterways within 16 million acres and provide a system for reducing effects from land management activities to aquatic resources through riparian management goals, landscape scale interim riparian management objectives, RHCAs, riparian standards, watershed analysis, and the designation of Key and Priority watersheds. These interim strategies have been in place since 1992 and are part of the management plans for Bureau of Land Management and Forest Service lands.

The Interior Columbia Basin Ecosystem Management Plan (ICBEMP) is the strategy that replaces the PACFISH and INFISH interim strategies when federal land management plans are revised. The Southwest Idaho Land and Resource Management Plan (LRMP) is the first LRMP under the strategy and provides measures that protect and restore soil, water, riparian and aquatic resources during project implementation while providing flexibility to address both short- and long-term social and economic goals on 6.6 million acres of National Forest lands. This plan includes a long-term Aquatic Conservation Strategy that focuses restoration funding in priority subwatersheds identified as important to achieving Endangered Species Act, Tribal, and Clean Water Act goals. The Southwest Idaho LRMP replaces the interim PACFISH/INFISH strategies and adds additional conservation elements, specifically, providing an ecosystem management foundation, a prioritization for restoration integrated across multiple scales, and adaptable active, passive and conservation management strategies that address both protection and restoration of habitat and 303(d) stream segments.

The Southeast Oregon Resource Management Plan (SEORMP) and Record of Decision is the second LRMP under the ICBEMP strategy which describes the long-term (20+ years)plan for managing the public lands within the Malheur and Jordan Resource Areas of the Vale District. The SEORMP is a general resource management plan for 4.6 million acres of Bureau administered public lands primarily in Malheur County with some acreage in Grant and Harney Counties, Oregon. The SEORMP contains resource objectives, land use allocations, management actions and direction needed to achieve program goals. Under the plan, riparian areas, floodplains, and wetlands will be managed to restore, protect, or improve their natural functions relating to water storage, groundwater recharge, water quality, and fish and wildlife values.

The Northwest Forest Plan covers 24.5 million acres in Washington, Oregon, and northern California. The Aquatic Conservation Strategy (ACS) is a component of the Northwest Forest Plan. It was developed to restore and maintain the ecological health of watersheds and the aquatic ecosystems. The four main components of the ACS (Riparian Reserves, Watershed Analysis, Key Watersheds, and Watershed Restoration) are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems.

It is the objective of the Forest Service and the Bureau of Land Management to manage and maintain habitat and, where feasible, to restore habitats that are degraded. These plans provide for the protection of areas that could contribute to the recovery of fish and, overall, improve riparian habitat and water quality throughout the basin. These objectives are accomplished through such activities as closing and rehabilitating roads, replacing culverts, changing grazing and logging practices, and re-planting native vegetation along streams and rivers.

4.1.8 Conservation Needs

The recovery planning process for the bull trout (Fish and Wildlife Service 2002a, p. 49) has identified the following conservation needs (goals) for bull trout recovery: (1) maintain the current distribution of bull trout within core areas as described in recovery unit chapters, (2) maintain stable or increasing trends in abundance of bull trout as defined for individual recovery units, (3) restore and maintain suitable habitat conditions for all bull trout life history stages and strategies, and (4) conserve genetic diversity and provide opportunity for genetic exchange.

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, p. 62) identifies the following tasks needed for achieving recovery: (1) protect, restore, and maintain suitable habitat conditions for bull trout, (2) prevent and reduce negative effects of non-native fishes, such as brook trout, and other non-native taxa on bull trout, (3) establish fisheries management goals and objectives compatible with bull trout recovery, (4) characterize, conserve, and monitor genetic diversity and gene flow among local populations of bull trout, (5) conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks, (6) use all available conservation programs and regulations to protect and conserve bull trout and bull trout habitats, (7) assess the implementation of bull trout recovery by management units, and (8) revise management unit plans based on evaluations.

Another threat now facing bull trout is warming temperature regimes associated with global climate change. Because air temperature affects water temperature, species at the southern margin of their range that are associated with cold water patches, such as bull trout, may become restricted to smaller, more disjunct patches or become extirpated as the climate warms (Rieman et al. 2007, p. 1560). Rieman et al. (2007, pp. 1558, 1562) concluded that climate is a primary determining factor in bull trout distribution. Some populations already at high risk, such as the

Jarbidge, may require "aggressive measures in habitat conservation or restoration" to persist (Rieman et al. 2007, p. 1560). Conservation and restoration measures that would benefit bull trout include protecting high quality habitat, reconnecting watersheds, restoring flood plains, and increasing site-specific habitat features important for bull trout, such as deep pools or large woody debris (Kinsella 2005, entire).

4.1.9 Critical Habitat

4.1.9.1 Designated Critical Habitat

4.1.9.1.1 Legal Status

The Service published a final critical habitat designation for the coterminus United States population of the bull trout on September 26, 2005 (70 FR 56212); the rule became effective on October 26, 2005. The scope of the designation involved the Klamath River, Columbia River, Coastal-Puget Sound, and Saint Mary-Belly River population segments (also considered as interim recovery units). Rangewide, the Service designated 143,218 acres of reservoirs or lakes and 4,813 stream or shoreline miles as bull trout critical habitat. We designated areas as critical habitat that (1) have documented bull trout occupancy within the last 20 years, (2) contain features essential to the conservation of the bull trout, (3) are in need of special management, and (4) were not excluded under section 4(b)(2) of the Act. The Final Rule excluded from designation those federally managed areas covered under PACFISH, INFISH, the Interior Columbia Basin Ecosystem Management Project, and the Northwest Forest Plan Aquatic Conservation Strategy. The Service determined that these strategies provide a level of conservation and adequate protection and special management for the primary constituent elements (PCEs) of critical habitat at least comparable to that achieved by designating critical habitat. Areas managed under these strategies do not meet the statutory definition of critical habitat (i.e., areas requiring special management considerations) and were therefore excluded. The excluded areas include much of the proposed critical habitat in Idaho; the final rule only designates 294 miles of stream/shoreline and 50,627 acres of reservoirs or lakes.

4.1.9.1.2 Conservation Role and Description of Critical Habitat

The conservation role of bull trout critical habitat is to support viable core area populations (70 FR 56212). Core areas reflect the metapopulation structure of the coterminus United States population of the bull trout and are the closest approximation of a biologically functioning unit for the purposes of recovery planning and risk analyses. Critical habitat units generally encompass one or more core areas and may include foraging, migration, and overwintering areas, outside of core areas, that are important to the survival and recovery (i.e., conservation) of the bull trout.

Because there were numerous exclusions associated with the final critical habitat designation process that reflect land ownership, designated critical habitat is often fragmented. These individual critical habitat segments are expected to contribute to the ability of the stream to support viable local and core area populations of the bull trout in each critical habitat unit. The PCEs of designated bull trout critical habitat are as follows:

1. Water temperatures that support bull trout use. Bull trout have been documented in streams with temperatures from 32 to 72 °F (0 to 22 °C) but are found more frequently in temperatures ranging from 36 to 59 °F (2 to 15 °C). These temperature ranges may vary

depending on bull trout life-history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence. Stream reaches with temperatures that preclude bull trout use are specifically excluded from designation.

2. Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures.

3. Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. This should include a minimal amount of fine substrate less than 0.25 inch (0.63 centimeter) in diameter.

4. A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, currently operate under a biological opinion that addresses bull trout, or a hydrograph that demonstrates the ability to support bull trout populations by minimizing daily and day-to-day fluctuations and minimizing departures from the natural cycle of flow levels corresponding with seasonal variation. This rule finds that reservoirs currently operating under a biological opinion that addresses bull trout provides management for PCEs as currently operated.

5. Springs, seeps, groundwater sources, and subsurface water to contribute to water quality and quantity as a cold water source.

6. Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows.

7. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish; and

8. Permanent water of sufficient quantity and quality such that normal reproduction, growth, and survival are not inhibited.

Critical habitat includes the stream channels within the designated stream reaches, the shoreline of designated lakes, and the inshore extent of marine nearshore areas, including tidally influenced freshwater heads of estuaries.

4.1.9.1.3 Current Range-wide Condition of Designated Bull Trout Critical Habitat

The condition of bull trout critical habitat varies across its range from poor to good. Although still relatively widely distributed across its historic range, the bull trout occurs in low numbers in many areas, and populations are considered depressed or declining across much of its range (67FR 71240). This condition reflects the condition of bull trout habitat.

Among the many factors that contribute to degraded PCEs, those which appear to be particularly significant and have resulted in a legacy of degraded habitat conditions are as follows: (1) fragmentation and isolation of local populations due to the proliferation of dams and water diversions that have eliminated habitat, altered water flow and temperature regimes, and impeded migratory movements; (2) degradation of spawning and rearing habitat and upper watershed areas, particularly alterations in sedimentation rates and water temperature, resulting from forest and rangeland practices and intensive development of roads; (3) the introduction and spread of nonnative species as a result of fish stocking and facilitated by degraded habitat conditions, particularly for brook trout and lake trout, which compete with bull trout for limited resources and, in the case of brook trout, hybridize with bull trout; (4) in the Coastal-Puget Sound region where amphidromous bull trout occur, degradation of mainstem river feeding, migrating, and overwintering (FMO) habitat, and the degradation and loss of marine nearshore foraging and migration habitat due to urban and residential development; and (5) degradation of foraging, migration, and overwintering habitat resulting from reduced prey base, roads, agriculture, development and dams.

4.1.9.2 Proposed Bull Trout Critical Habitat

4.1.9.2.1 Legal Status

Ongoing litigation resulted in the U.S. District Court for the District of Oregon granting the Service a voluntary remand of the 2005 critical habitat designation. Subsequently the Service published a proposed critical habitat rule on January 14, 2010 (75 FR 2260).

The Service proposed 32 critical habitat units (CHUs). Each CHU is comprised of a number of specific streams or reservoir /lake areas, which are identified as subunits in the proposed rule. Approximately 36,498 km (22,679 mi) of streams (which includes 1,585.7 km (985.3 mi) of marine shoreline area, and 215,870 ha (533,426 ac) of reservoirs or lakes) are being proposed as critical habitat throughout the range of bull trout. The 2005 designation will remain in effect until a new final rule is published. The projected publish date is September 30, 2010.

4.1.9.2.2 Conservation Role and Description of Critical Habitat

In general the conservation role of critical habitat is to support viable core area populations (75 FR 2291). The Service is proposing to designate critical habitat to support the following bull trout recovery goals: conserve the opportunity for diverse life-history expression, conserve the opportunity for genetic diversity, ensure that bull trout are distributed across representative habitats, ensure sufficient connectivity among populations, ensure sufficient habitat to support population viability, address threats, and ensure sufficient redundancy in conserving population units.

In determining which areas to propose as critical habitat, the Service considered the physical and biological features that are essential to the conservation of bull trout and that may require special management considerations or protection. These features are the PCEs laid out in the appropriate quantity and spatial arrangement for conservation of the species. The PCEs of proposed critical habitat are:

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.

2. Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including, but not limited to, permanent, partial, intermittent, or seasonal barriers.

3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.

5. Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.

6. Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.

7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph.

8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

9. Few or no nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass; inbreeding (e.g., brook trout); or competitive (e.g., brown trout) species present.

4.1.9.2.3 Current Range-wide Condition of Proposed Bull Trout Critical Habitat

The condition of proposed bull trout critical habitat varies across its range from poor to good. Although still relatively widely distributed across its historic range, the bull trout occurs in low numbers in many areas, and populations are considered depressed or declining across much of its range (67 FR 71240). This condition reflects the condition of bull trout habitat.

The primary land and water management activities impacting the physical and biological features essential to the conservation of bull trout include timber harvest and road building, agriculture and agricultural diversions, livestock grazing, dams, mining, urbanization and residential development, and non-native species presence or introduction (75 FR 2282).

4.2 Environmental Baseline of the Action Area

This section assesses the effects of past and ongoing human and natural factors that have led to the current status of the species, its habitat and ecosystem in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with the consultations in progress.

4.2.1 Status of the Bull Trout in the Action Area

Bull trout are found throughout the action area in spawning and early rearing habitat (local populations) as well as in habitat used for FMO. Spawning and early rearing habitat is typically found in headwater (often roadless) areas while mainstem rivers provide FMO habitat.

As the proposed Program is programmatic in nature and encompasses a large area, the analysis presented in this Opinion will assess bull trout baseline status at the core area level as opposed to the smaller, local population scale. The draft recovery plan (Fish and Wildlife Service 2002a, p. 98) identified a bull trout core area as the closest approximation of a biologically functioning unit for bull trout. By definition, a core area includes a combination of core habitat (i.e., habitat that could supply all elements for the long-term security of bull trout). Core areas contain both spawning and early rearing habitat and FMO habitat. Core areas constitute the basic unit on which to gauge recovery (Fish and Wildlife Service 2002a, p. 98).

Table 3. Bull Trout Habitat Condition and Extirpation Risk by Core Area [adapted from Table 3 in the Service's Bull Trout Core Area Conservation Status Assessment (Service 2005)].

	Management Unit – Core Area	Brook Trout (% Key streams occupied)	Road Density (mi/mi2)	Habitat Condition based on Road Density (<1 mi/sq.mi. = high, 1 – 3 mi/sq.mi. = moderate, and > 3 mi./sq.mi. = low)	Risk of extirpation
1	Coeur d'Alene – Coeur d'Alene Lake	20	1.9	Moderate	High risk
2	Clark Fork – Lake Pend Oreille	38	2.2	Moderate	Potential risk
3	Clark Fork – Priest Lakes	48	1.7	Moderate	High risk
4	Kootenai – Kootenai River	87	2	Moderate	At risk
5	Clearwater – NF Clearwater	18	1.4	Moderate	At risk
6	Clearwater – Fish Lake (NF)	0	0.2	High	High risk
7	Clearwater – Lochsa R	0	0.7	High	At risk
8	Clearwater – Fish Lake (Lochsa)	0	0.5	High	At risk
9	Clearwater – Selway R.	32	0.2	High	Potential risk
10	Clearwater – SF Clearwater	62	1.4	Moderate	At risk
11	Clearwater – Middle-Lower	25	1.9	Moderate	At risk
12	Salmon – Upper Salmon	51	0.5	High	Potential risk
13	Salmon – Pahsimeroi R.	12	0.7	High	At risk
14	Salmon – Lake Cr.	0	1	Moderate	At risk
15	Salmon – Lehmhi R.	41	0.8	High	At risk
16	Salmon – Middle Salmon R. – Panther	26	0.7	High	At risk
17	Salmon – Opal Lake	0	0	High	Potential risk
18	Salmon – Middle Fork Salmon	32	0.2	High	Low risk
19	Salmon – Middle Salmon-Chamberlain	28	0.3	High	Potential risk
20	Salmon – SF Salmon	51	0.5	High	At risk
21	Salmon – Little-Lower Salmon	70	1.6	Moderate	High risk

	Management Unit – Core Area	Brook Trout (% Key streams occupied)	Road Density (mi/mi2)	Habitat Condition based on Road Density (<1 mi/sq.mi. = high, 1 – 3 mi/sq.mi. = moderate, and > 3 mi./sq.mi. = low)	Risk of extirpation
22	SW Idaho – Arrowrock	13	0.9	High	At risk
23	SW Idaho – Anderson Ranch	26	0.8	High	At risk
24	SW Idaho – Lucky Peak	Present	1.8	Moderate	High risk
25	SW Idaho – Upper SF Payette R.	12	0.6	High	At risk
26	SW Idaho – MF Payette R.	35	1.3	Moderate	At risk
27	SW Idaho – Deadwood R.	0	0.5	High	High risk
28	SW Idaho – NF Payette R.	2	1.6	Moderate	High risk
29	SW Idaho – Squaw Creek	19	1.4	Moderate	High risk
30	SW Idaho – Weiser R.	39	1.4	Moderate	High risk
31	SW Idaho – Little Lost	84	0.4	High	At risk
32	Sheep	0	0.5	High	Unknown
33	Granite	0	0	High	Unknown

Of the 33 core areas in Idaho with a designated threat ranking, 9 are at High risk, 16 are At Risk, 5 are at Potential Risk, 1 is at Low Risk, and 2 are unknown. Core areas at High Risk include Couer d'Alene, Priest Lakes, Fish Lake (North Fork), Little-Lower Salmon River, Lucky Peak, Deadwood River, North Fork Payette River, Squaw Creek, and Weiser River. Core areas At Risk include Fish Lake (Lochsa), Lochsa River, Middle-Lower Clearwater River, North Fork Clearwater River, South Fork Clearwater River, Kootenai River, Lake Creek, Lehmi River, Middle Salmon River-Panther, Pahsimeroi River, South Fork Salmon River, Anderson Ranch, Arrowrock, Little Lost River, Middle Fork Payette River, and Upper South Fork Payette River. Core areas at Potential Risk include Lake Pend Oreille, Selway River, Middle Salmon-Chamberlain, Opal Lake, and Upper Salmon. The only core area at Low Risk is the Middle Fork Salmon River. The status of Sheep and Granite Creeks is unknown.

4.2.1.1 Status of Designated Critical Habitat in the Action Area

The following streams and lakes are designated as bull trout critical habitat in Idaho:

Clark Fork River Basin

Lake Pend Oreille Subunit – East River, Gold Creek, Granite Creek, Grouse Creek, Lightning Creek, Middle Fork East River, North Fork Grouse Creek, Pack River, Priest River, Tarlac Creek, Trestle Creek, Twin Creek, Uleda Creek

Priest Lake and River Subunit – Cedar Creek, Granite Creek, Hughes Fork, Indian Creek, Kalispell Creek, Lion Creek North Fork Indian Creek, Soldier Creek, South Fork Granite Creek, South Fork Indian Creek, South Fork Lion Creek, Trapper Creek, Two Mouth Creek, and Upper Priest River

Coeur d'Alene Lake Basin

Beaver Creek, Coeur d'Alene Lake and River, Eagle Creek, Fly Creek, North Fork Coeur d'Alene River, Prichard Creek, Ruby Creek, Saint Joe River, Steamboat Creek, and Timber Creek

Snake River

Sections between Farewell Bend State Park and Pine Creek.

4.2.1.2 Status of Proposed Critical Habitat in the Action Area

In Idaho, the proposed critical habitat includes 9,670.6 miles of stream and shoreline and 197,914.7 acres of reservoir and lake area. The proposed critical habitat in Idaho is located within the following counties; Adams, Benewah, Blaine, Boise, Bonner, Boundary, Butte, Camas, Canyon, Clearwater, Custer, Elmore, Gem, Idaho, Kootenai, Lemhi, Lewis, Nez Perce, Owyhee, Shoshone, Valley and Washington.

4.2.2 Factors Affecting the Bull Trout and Critical Habitat in the Action Area

As previously described in the Status of the Species section of this Opinion, bull trout distribution, abundance, and habitat quality have declined rangewide primarily from the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest, poaching, entrainment, loss or reduction in runs of anadromous salmonids, and the introduction of nonnative fish species such as the brook trout.

Land and water management activities that depress bull trout populations and degrade proposed and designated critical habitat include dams and other water diversion structures, forest management practices, livestock grazing, agriculture, road construction and maintenance, mining, and urban and rural development. All of these activities have occurred or are occurring in the action area to varying degrees with resulting adverse impacts on bull trout and bull trout habitat.

Road building and land management activities have been extensive in some watersheds containing local populations. Because of the numerous ecological effects of road construction and associated activities, such as timber harvest, (Jones et al. 2001, p.76, Trombulak and Frissell 2000, p.18) road density can be used as an indicator of watershed condition. Road density of less than 1 mile of road per square mile of watershed indicates high watershed condition, 1 to 3 miles indicates moderate condition, and greater than 3 miles indicates low condition (National Marine Fisheries Service 1996, entire). There appears to be an inverse relationship between watershed road density and bull trout occurrence in that bull trout typically do not occur where road densities exceed 1.7 miles per square mile (Fish and Wildlife Service 2002a, p. 18). Bull trout population strongholds occur most often in undisturbed/roadless areas (Quigley and Arbelide 1997, p. 1183; Kessler et al. 2001, p. ES-1). Table 3 shows that for the Idaho core areas; habitat condition is rated as high for 19 core areas and moderate for 14 core areas. No core area is rated as low for habitat condition.

As shown in Table 3, brook trout, an introduced species that competes and hybridizes with bull trout (and is therefore considered a threat factor), are present in all but seven of the core areas. For the core areas with brook trout, the percentage of key streams occupied ranges from 87 percent (Kootenai River) to 2 percent (NF Payette River).

Changes in hydrology and temperature caused by changing climate have the potential to negatively impact aquatic ecosystems in Idaho, with salmonid fishes being especially sensitive. Average annual temperature increases due to increased carbon dioxide are affecting snowpack, peak runoff, and base flows of streams and rivers (Mote et al. 2003, p. 45). Increases in water temperature may cause a shift in the thermal suitability of aquatic habitats (Poff et al. 2002, p. iii). For species that require colder water temperatures to survive and reproduce, warmer temperatures could lead to significant decreases in available suitable habitat. Increased frequency and severity of flood flows during winter can affect incubating eggs and alevins in the streambed and over-wintering juvenile fish. Eggs of fall spawning fish, such as bull trout, may suffer high levels of mortality when exposed to increased flood flows (ISAB 2007, p. iv).

Table 4. Matrix of Pathways and Indicators showing baseline condition for selected habitat indicators and the effects to those indicators from implementing Program activities (from the Assessment). Note: The matrix only includes baseline condition for those indicators that may be affected by implementation of Program actions.

Pathways	Environmental Baseline			Effects of the Actions		
Indicators	Properly Functioning	At Risk	Unacceptable Risk	Restore	Maintain	Degrade
Watershed Conditions:						
Riparian Vegetation Condition	...	X	...	...	...	X
Sediment Yield	...	X	...	...	...	X
Channel Condition & Dynamics:						
Width/Depth Ratio	...	X	...	...	...	X
Streambank Stability	...	X	...	...	...	X
Water Quality:						
Temp – Snake River Basin Steelhead and Chinook	...	...	X	...	X	...
Temp – Bull Trout	...	...	X	...	X	...
Suspended Sediment	...	X	...	...	...	X
Chemical Contamination/Nutrients	X	...	...	...	X	...
Habitat Elements:						
Cobble Embeddedness	...	X	...	...	...	X
Percent Surface Fines	...	X	...	...	...	X
Percent Fines by Depth	X	...	...	...	...	X
Large Woody Debris	...	X	...	...	X	...
Pool Frequency	...	X	...	...	...	X
Pool Quality	...	X	...	...	...	X

4.3 Effects of the Proposed Action

The implementing regulations for section 7 define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline" (50 CFR § 402.02). "Indirect effects" are caused by or result from the agency action, are later in time, but are still reasonably certain to occur. Indirect effects may occur outside of the immediate footprint of the project area, but would occur within the action area as defined (50 CFR § 402.02).

4.3.1 Direct and Indirect Effects of the Proposed Action

As shown in Table 4 (Matrix of Pathways and Indicators or MPI), relevant Program project types involving instream work or work below the ordinary high water mark (OHWM) are expected to degrade the baseline condition of the following bull trout habitat indicators: riparian vegetation condition, sediment yield, width/depth ratio, streambank stability, suspended sediment, cobble embeddedness, percent surface fines, percent fines by depth, pool frequency, and pool quality.

The relevant project types that may affect these indicators include two-lane bridge replacement, bank stabilization (riprap), bank stabilization (gabion), culvert installation – perennial stream, culvert extension – perennial stream, and culvert maintenance – perennial stream, geotechnical drilling, and small structure repair (see Table 2). Refer to the Assessment for a completed description of these work types including activity specific BMPs. The effects of these relevant work types on affected indicators are discussed in more depth below. The following discussion is excerpted from the Assessment with minor edits added for clarification. The discussion follows the layout in Table 4 showing the specific affected Indicator(s) under their associated Pathway. Only those indicators that will be degraded (i.e., adversely affected) are addressed here. We assume that effects to all other indicators in Table 4 are insignificant or discountable (as indicated by "maintain"). Additionally, Table 4 does not include indicators that will not be affected by the Program.

4.3.1.1 Watershed Conditions

4.3.1.1.1 Riparian Vegetation Condition

All of the relevant project types have the capacity to adversely affect riparian vegetation condition through both temporary and permanent ground disturbing activities. The proposed action for the two-lane bridge replacement is the only action that has specific measures to replace disturbed vegetation. Bank stabilization actions typically involve the covering of some riparian vegetation for the length of the project, as do culvert installation and extension actions. Culvert maintenance actions might have a small adverse impact on riparian vegetation, but this will only be short-term in nature.

Although these actions might have an adverse impact on riparian vegetation, these impacts are typically small relative to the project's action area and even smaller when considered in a watershed context.

4.3.1.1.2 Sediment Yield

All of the relevant project types have the capacity to adversely affect sediment yield and all have preventative measures (BMPs) in place to minimize sediment yield effects. These BMPs are primarily directed at minimizing sediment delivery from on-shore ground disturbance (e.g., using fiber wattles or silt fences). However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate and will result in temporary elevated suspended sediment/turbidity.

Exposure to suspended sediment concentrations of 55 milligrams per liter (mg/l) for 3 hours or more is likely to negatively affect (minor physiological distress and reduced feeding rate) adult and juvenile salmonids (Newcombe and Jensen 1996, p. 698). Bash et al. (2001, p. 24) note that bull trout are more sensitive than other salmonids to elevated suspended sediment and turbidity. The Service expects that any bull trout present in the action area during in-channel work may be adversely affected by exposure to suspended sediment concentrations exceeding 55 mg/l for durations of 3 hours or more. Because there is a limited amount of in-stream work expected, the amount of sediment produced during Program implementation is also expected to be relatively small and the Service expects adverse effects to bull trout to be limited in duration and spatial extent. Additionally, the Department will meet Idaho state water quality standards during the implementation of any in-stream work.

4.3.1.2 Channel Conditions and Dynamics

4.3.1.2.1 Width/Depth Ratio

Width/depth ratios could be adversely affected by activities that produce sediment and consequently result in a decrease in pool depths. All of the relevant project types have the capacity to adversely affect sediment yield and all have preventative measures (BMPs) in place to minimize sediment yield effects. These BMPs are primarily directed at minimizing sediment delivery from on-shore ground disturbance (e.g., using fiber wattles or silt fences). However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate and will result in temporary elevated suspended sediment/turbidity.

Although these actions may have an adverse impact on sediment yield, these impacts are typically small relative to the project's action area and even smaller when considered in a watershed context. As the effects on sediment yield are small, the effects on width/depth ratios would likewise be small.

4.3.1.2.2 Streambank Stability

Streambanks could be temporarily destabilized by activities conducted during the two-lane bridge replacement, culvert installation, culvert extension and culvert maintenance activities. However, the areas disturbed by these activities would be very small and the disturbance effects are not likely to last longer than one year.

Streambank stability could be negatively affected by any actions involving bank stabilization. Many areas that will receive rip-rap are areas that have already had armoring treatments. The net change in streambank disturbance in these areas will be minimal. The immediate area of the project would be negatively affected because of the rigidity of the structures — a rigidity that is not typically found in most stream types. This rigidity often reduces the biological availability of the streambank habitat by simplifying habitat features. Energy from streamflow is transferred downstream after streambanks are hardened; this often leads to destabilized streambanks. The proposed action includes measures to increase habitat availability such as the development of an irregular toe and bank line and the use of large, irregular rocks to create interstitial spaces and small alcoves. These measures will also create roughness which will reduce the velocity of the streamflow being directed downstream; this will therefore reduce the potential for downstream streambank destabilization.

4.3.1.3 Water Quality

4.3.1.3.1 Suspended Sediment

All of the relevant project types have the capacity to adversely affect sediment yield and all will have preventative measures in place to minimize sediment yield effects. The measures proposed are primarily directed at minimizing sediment delivery from on-shore ground disturbance. However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate. Because there is a limited amount of in-stream work, the amount of sediment produced will be relatively small. Idaho state water quality standards will be met during project implementation. (See Sediment Yield, section 4.3.1.1.2 above.)

Although these actions may have an adverse impact on sediment yield, these impacts are typically small relative to the project's action area and even smaller when considered in a watershed context.

4.3.1.4 Habitat Elements

4.3.1.4.1 Cobble Embeddedness

Cobble embeddedness is primarily affected by changes in streamflow or sediment delivery. There are no proposed actions that will affect streamflows, which means that the key factor which could affect embeddedness is sediment yield. All of the relevant project types have the capacity to adversely affect sediment yield and all have preventative measures in place to minimize sediment yield effects. The measures proposed are primarily directed at minimizing sediment delivery from on-shore ground disturbance. However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate. Because there is a limited amount of in-stream work, the amount of sediment produced will be relatively small. Idaho state water quality standards will be met during project implementation (See Sediment Yield, section 4.3.1.1.2 above.)

Although these actions may have an adverse impact on sediment yield, these impacts are typically small relative to the project's action area and even smaller when considered in a watershed context.

4.3.1.4.2 Percent Surface Fines

Percent surface fines is primarily affected by changes in streamflow or sediment delivery. There are no proposed actions that will affect streamflows, which means that the key factor which could affect surface fines is sediment yield. All of the relevant project types have the capacity to adversely affect sediment yield and all have preventative measures in place to minimize sediment yield effects. The measures proposed are primarily directed at minimizing sediment delivery from on-shore ground disturbance. However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate. Because there is a limited amount of in-stream work, the amount of sediment produced will be relatively small. Idaho state water quality standards will be met during project implementation.

Although these actions may have an adverse impact on sediment yield, these impacts are typically small relative to the project's action area and even smaller when considered in a watershed context.

4.3.1.4.3 Percent Fines By Depth

Percent fines by depth is primarily affected by changes in streamflow or sediment delivery. There are no proposed actions that will affect streamflows, which means that the key factor which could affect the percentage of fines by depth is sediment yield. All of the relevant project types have the capacity to adversely affect sediment yield and all have preventative measures in place to minimize sediment yield effects. The measures proposed are primarily directed at minimizing sediment delivery from on-shore ground disturbance. However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate. Because there is a limited amount of in-stream work, the amount of sediment produced will be relatively small. Idaho state water quality standards will be met during project implementation (See Sediment Yield, section 4.3.1.1.2 above.)

Although these actions might have an adverse impact on sediment yield, these impacts are typically small relative to the project's action area and even smaller when considered in a watershed context.

4.3.1.4.4 Pool Frequency

Pool Frequency is most likely affected by excessive sediment yield or reductions in the large woody debris that helps form pools in small to medium size streams.

All of the relevant project types have the capacity to adversely affect sediment yield and all have preventative measures in place to minimize sediment yield effects. The measures proposed are primarily directed at minimizing sediment delivery from on-shore ground disturbance. However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate. Because there is a limited amount of in-stream work, the amount of sediment produced will likely also be relatively small. Idaho state water quality standards will be met during project implementation.

Most of the streams which Department roads border are larger streams in which pool formation is not driven by large woody debris processes. Also, there are not large areas where riparian vegetation will be affected, further minimizing the risk of affecting pool formation from a lack of large woody debris.

4.3.1.4.5 Pool Quality

Pool Quality is most commonly affected by excessive sediment yield or reductions in the large woody debris that helps form pools in small to medium streams.

All of the relevant project types have the capacity to adversely affect sediment yield and all have preventative measures in place to minimize sediment yield effects. The measures proposed are primarily directed at minimizing sediment delivery from on-shore ground disturbance. However, as all of these actions have the potential for in-stream work, there will be sediment produced through the disturbance of the stream substrate. Because there is a limited amount of in-stream work, the amount of sediment produced will likely also be relatively small. Idaho state water quality standards will be met during project implementation.

Most of the streams bordered by Department roads are larger streams in which pool formation is not driven by large woody debris processes. Also, there are not large areas where riparian vegetation will be affected, further minimizing the risk of affecting pool formation from a lack of large woody debris.

4.3.1.5 Effects to Fish

4.3.1.5.1 Harassment

All of the proposed actions with potential adverse effects to bull trout involve in-stream work. As noted above in sediment yield, excessive sediment in the river may cause bull trout to avoid the project area. These effects are expected to be short in duration and small in scale. Instream work will only occur in coordination with IDFG personnel and will only occur during approved in-stream work windows. These inwater works windows are typically mid-summer when bull trout are often in headwater reaches of streams; these stream reaches do not often coincide with the highways considered in this consultation. Pile driving may occur during construction of two-lane bridge projects or retaining walls. Pile driving creates sound effects which adversely affect fish. All pile-driving work will take place in dewatered work areas. As such, pile-driving sound effects will be non-lethal and limited to harassment of listed species.

4.3.1.5.2 Redd Disturbance

All of the proposed actions that are likely to adversely affect listed species involve in-stream work. In-stream work will only occur during approved in-stream work windows and in coordination with IDFG personnel. Because of this adherence to in-stream work window (a time when redds are not typically present in the stream) the redds of listed species will not likely be adversely affected.

4.3.1.6 Bull Trout Subpopulation Characteristics and Habitat Integration

Effect to the action will potentially degrade existing conditions for bull trout subpopulation characteristics and habitat integration. Projects may potentially adversely impact bull trout habitat. Effects are anticipated to be small in scale and short in duration.

4.3.1.7 Fish Salvage Effects

Bull trout may be injured or killed during fish relocation efforts associated with Program in-water work activities. Injuries and mortality could occur from electroshocking; however, mortality associated with handling stress is unlikely. Releasing captured fish into new habitat may lead to competitive interactions with other fish and, in some cases, could lead to predation on any disoriented fish being released. The effects from electrofishing and fish relocation efforts will be reduced by having a fisheries biologist or technician from the IDFG conduct the salvage efforts. The use of electrofishing or other methods to remove bull trout from these work sites requires the possession of a current Scientific Collecting Permit issued by IDFG. The permit holder must follow all associated permit requirements. The Service has already analyzed the effect of work conducted under the Department's permits in a February 2000 intra-Service Biological Opinion (Fish and Wildlife Service 2000).

4.3.2 Effects to Critical Habitat

Both designated and proposed critical habitat for bull trout are present in the action area and will be addressed separately in the following sections. The MPI for bull trout is used to evaluate and document baseline conditions and to aid in determining whether a project is likely to adversely affect or result in the incidental take of bull trout. See Table 4 above for the MPI used to assess effects to bull trout.

Analysis of the affected MPI habitat indicators can provide a thorough evaluation of the existing baseline condition and potential project impacts to the Primary Constituent Elements (PCEs) of designated and proposed bull trout critical habitat (see Tables 5 and 6).

4.3.2.1 Designated Bull Trout Critical Habitat

The effects to the PCEs from Program implementation are summarized in Table 5.

Table 5. The PCEs of designated critical habitat, associated MPI habitat indicators affected by the Program, and indicators degraded by implementing Program actions for each PCE.

	2005 Final CH PCEs	Associated Habitat Indicators	Habitat Indicators Degraded by Proposed Action
1	Water temperatures that support bull trout use. Bull trout have been documented in streams with temperatures from 32 to 72 °F (0 to 22 °C) but are found more frequently in temperatures ranging from 36 to 59 °F (2 to 15 °C). These temperature ranges may vary depending on bull trout life history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence. Stream reaches with temperatures that preclude any bull trout use are specifically excluded from designation.	Temperature, refugia, pool frequency and quality, width/depth ratio, peak/base flow, streambank stability, floodplain connectivity, road density	Width/depth ratio, streambank stability, riparian vegetation condition
2	Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures.	Large woody debris, pool frequency and quality, width/depth ratio, off-channel habitat, streambank stability, riparian vegetation condition, floodplain connectivity, disturbance history and regime, refugia	Pool frequency and quality, width/depth ratio, streambank stability, riparian vegetation condition
3	Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. This should include a minimal amount of fine substrate less than 0.25 inch (0.63 centimeter) in diameter.	Sediment, cobble embeddedness, large woody debris, pool frequency and quality, streambank stability	Sediment, cobble embeddedness, pool frequency and quality
4	A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, currently operate under a biological opinion that addresses bull trout, or a hydrograph that demonstrates the ability to support bull trout populations by minimizing daily and day-to-day fluctuations and minimizing departures from the natural cycle of flow levels corresponding with seasonal variation.	Peak/base flow, road density, riparian vegetation condition, floodplain connectivity	Riparian vegetation condition
5	Springs, seeps, groundwater sources, and subsurface water to contribute to water quality and quantity as a cold water source.	Flood plain connectivity, changes in peak/base flows, cobble embeddedness, road density, streambank stability, chemical contamination/nutrients	Sediment
6	Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows.	Temperature, sediment, chemical contamination/nutrients, physical barriers, peak/base flow, width/depth ratio, refugia	Width/depth ratio
7	An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	Floodplain connectivity, riparian vegetation condition, pool frequency and quality, cobble embeddedness, temperature, chemical contaminants and nutrients	Riparian vegetation condition

	2005 Final CH PCEs	Associated Habitat Indicators	Habitat Indicators Degraded by Proposed Action
8	Permanent water of sufficient quantity and quality such that normal reproduction, growth, and survival are not inhibited.	Floodplain connectivity, peak/base flow, temperature, sediment, chemical contaminant and nutrients	Sediment

As shown in Table 5, relevant Program actions may adversely affect (indicated by degrade in the Table) all of the PCEs of designated bull trout critical habitat when those actions occur in that habitat. Designated critical habitat intersects with Department administered roads only in the Panhandle region of Idaho, so the number of Program actions that may impact critical habitat is expected to be small. Due to the programmatic nature of the proposed action, the Service cannot predict exactly where (in terms of specific critical habitat segments) these adverse effects may occur. We do expect that these effects will be short in duration and limited in spatial extent, as discussed above in the sections addressing effects to the species. The BMPs are expected to further reduce the magnitude of those effects.

4.3.2.2 Proposed Bull Trout Critical Habitat

Table 6. The PCEs of proposed critical habitat, associated MPI habitat indicators affected by the Program, and indicators degraded by implementing Program actions for each PCE.

	2010 Proposed CH PCEs	Associated Habitat Indicators	Habitat Indicators Degraded by Proposed Action
1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.	Flood plain connectivity, changes in peak/base flows, cobble embeddedness, road density, streambank stability, chemical contamination/nutrients	Cobble embeddedness, streambank stability,
2	Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.	Temperature, sediment, chemical contamination/nutrients, physical barriers, peak/base flow, width/depth ratio, refugia	Sediment, width/depth ratio
3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	Floodplain connectivity, riparian vegetation condition, pool frequency and quality, cobble embeddedness, temperature, chemical contaminants and nutrients	Riparian vegetation condition, pool frequency and quality, cobble embeddedness
4	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.	Large woody debris, pool frequency and quality, width/depth ratio, off-channel habitat, streambank stability, riparian vegetation condition, floodplain connectivity, disturbance history and regime, refugia	Pool frequency and quality, width/depth ratio, streambank stability, riparian vegetation condition
5	Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.	Temperature, refugia, pool frequency and quality, width/depth ratio, change in peak/base flows, streambank stability, floodplain connectivity, road density	Pool frequency and quality, width/depth ratio, streambank stability
6	Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.	Sediment, cobble embeddedness, large woody debris, pool frequency and quality, streambank stability	Sediment, cobble embeddedness, pool frequency and quality, streambank stability
7	A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph.	Peak/base flow, road density, riparian vegetation condition, floodplain connectivity,	Riparian vegetation condition
8	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.	Floodplain connectivity, peak/base flow, temperature, sediment, chemical contaminant and nutrients	Sediment
9	Few or no nonnative predatory (e.g., lake trout,	Physical barriers	N/A

	2010 Proposed CH PCEs	Associated Habitat Indicators	Habitat Indicators Degraded by Proposed Action
	walleye, northern pike, smallmouth bass; inbreeding (e.g., brook trout); or competitive (e.g., brown trout) species present.		

As shown in Table 6, eight of the nine PCEs of proposed critical habitat for bull trout may be adversely affected (indicated by degrade in the Table) when the relevant Program work types occur in that habitat. The only PCE not affected by the Program is PCE 9. Due to the programmatic nature of the proposed action, the Service cannot predict exactly where (in terms of specific proposed critical habitat segments) these effects may occur. However, because proposed critical habitat approximates the range of bull trout in Idaho, there is an increased probability of Program actions affecting that habitat. We do expect that adverse effects, when they occur, will be short in duration and limited in scope as discussed above in the sections addressing effects to the species. The BMPs are expected to further reduce the magnitude of those effects.

It should be noted that due to the programmatic nature of the proposed action, we lack site specificity regarding potential effects to the bull trout and its proposed and designated critical habitat. We will be able to better address potential effects during the pre-project review process where the Agencies provide site-specific information for each proposed Program action. The Service can then ensure consistency with the analyses and conclusions included in this Opinion. If the pre-project review identifies that a Program action is not consistent with our Opinion, that action will need to undergo a separate section 7 consultation.

4.3.3 Effects of Interrelated or Interdependent Actions

The Service did not identify any interrelated or interdependent actions associated with the proposed action.

4.4 Cumulative Effects

The implementing regulations for section 7 define cumulative effects to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

U.S. Census data (http://quickfacts.census.gov/qfd/states/16/16035.html) indicates that some counties within the action area have decreasing populations while some have increasing populations. However, between 2000 and 2008, the overall population in the 24 Idaho counties that encompass the range of bull trout in Idaho increased by approximately 7 percent. In that same time period, the population of Idaho grew from 1,293,953 to 1,523,816 people, or an 18 percent increase. Thus, population growth within the action area lagged behind that of both Idaho as whole and the nation during that time period. From 1990 to 2000, population density in the action area increased from 3.2 to 3.5 persons per square mile, which remains much lower than either the densities for the State of Idaho as a whole or the nation, 15.6 and 79.6 persons per square mile, respectively. Thus, the Service assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the action area continues to grow, demand for agricultural, commercial, or residential development is also likely to grow. The effects of new development caused by that demand are likely to reduce the conservation value of the habitat within the action area.

Illegal and inadvertent harvest of bull trout is also considered a cumulative effect. Harvest can occur through both misidentification and deliberate catch. Schmetterling and Long (1999, p. 1) found that only 44 percent of the anglers they interviewed in Montana could successfully identify bull trout. Being aggressive piscivores, bull trout readily take lures or bait (Ratliff and Howell 1992, pp. 15-16). IDFG report that 400 bull trout were caught and released in the regional (Clearwater administrative region) waters of the Salmon and Snake Rivers during the 2002 salmon and steelhead fishing seasons. In the Little Salmon River, 89 bull trout were caught and released during the same fishing seasons (Idaho Department of Fish and Game 2004, p. 11). Spawning bull trout are particularly vulnerable to harvest because the fish are easily observed during autumn low flow conditions. Hooking mortality rates range from 4 percent for non-anadromous salmonids with the use of artificial lures and flies (Schill and Scarpella 1997, p. 1) to a 60 percent worst-case scenario for bull trout taken with bait (Cochnauer et. al. 2001, p. 21). Thus, even in cases where bull trout are released after being caught, some mortality can be expected.

Warming of the global climate seems quite certain. Changes have already been observed in many species' ranges consistent with changes in climate (ISAB 2007, p. iii; Hansen et al. 2001, p. 767). Future climate change may lead to fragmentation of suitable habitats that may inhibit adjustment of plants and wildlife to climate change through range shifts (ISAB 2007, p. iii; Hansen et al. 2001, pp. 768-773). Changes due to climate change and global warming could be compounded considerably in combination with other disturbances such as fire and invasive species. Fire frequency and intensity have already increased in the past 50 years, particularly in the past 15 years, in the shrub steppe and forested regions of the west (ISAB 2007, p. iii). Larger climate-driven fires can be expected in Idaho and Montana in the future. Small isolated bull trout populations will be at increased risk of extirpation in the event of larger and more numerous fires. In addition, the preference of bull trout for colder water temperatures gives them a competitive advantage over invasive species, such as brook trout, inhabiting warmer stream reaches. Rahel et. al. (2008, p. 552) state that "climate change will produce a direct threat to bull trout through thermally stressful temperatures and an indirect threat by boosting the competitive ability of other trout species present."

Although cumulative effects can be identified, we cannot quantify the magnitude of their impacts on bull trout populations. Except for climate change, we do not expect cumulative effects to appreciably alter the existing baseline condition in the action area during the five-year lifetime of the project. We cannot be so certain on the effects of climate change.

4.5 Conclusion

The Service has reviewed the current status of bull trout, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects. The Service concludes that direct effects to bull trout will be limited to short-term disturbance, feeding rate reduction, and physiological distress to adult and subadult bull trout resulting in take in the form of harm from in-water sediment effects. Sound effects from pile-driving may harass individual adult or sub-adult bull trout. All of these anticipated effects should be minimized by the BMPs incorporated into the Program. Because Department roads are generally located in FMO habitat, Program activities are not anticipated in bull trout spawning areas; therefore, egg, alevins, or fry are not expected to be affected by the Program. The Service expects that the numbers, distribution, and reproduction of bull trout in the action area or in the Columbia Basin population segment will not be significantly changed as a result of this project. Therefore, it is the Service's biological opinion that the proposed action will not jeopardize the coterminous population of bull trout.

Although the PCEs of designated bull trout critical habitat may be adversely affected by the Program, we expect these effects to be limited in duration and spatial extent. We also expect the BMPs incorporated into the Program to minimize effects. Designated critical habitat occurs in only a limited portion of the action area, so the number of Program activities potentially impacting critical habitat will be small. Impacts to critical habitat segments will not affect the functioning of Critical Habitat Units. Therefore, we conclude that the Program will not destroy or adversely modify designated critical habitat.

We also conclude that the Program will not destroy or adversely modify proposed bull trout critical habitat. Although the number of Program activities occurring in proposed critical habitat is larger than those occurring in designated critical habitat (because proposed critical habitat occurs throughout the action area), we again anticipate that effects will be limited in duration and spatial extent. All affected Critical Habitat Units will remain functional.

4.6 Incidental Take Statement

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of an Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Agencies so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply.

4.6.1 Amount or Extent of Take Anticipated

Bull trout occur throughout the action area; however, it is difficult for us to anticipate the exact number of individual bull trout that will be taken as a result of Program activities. Therefore, to address take associated with sediment, turbidity and pile-driving, we will use the amount of habitat affected as a surrogate. We anticipate that all adult and subadult bull trout in the immediate vicinity of in-stream Program activities and downstream 600 feet (i.e., the assumed extent of downstream sediment or pile-driving sound effects) from each of these activity sites, will be subject to take in the form of harm from direct exposure to the increased levels of suspended sediment, turbidity, and deposited sediment (resulting from relevant work types in Table 2 including, but not limited to, bank stabilization) or harassment from the sound effects associated with pile-driving. Incidental take of bull trout associated with project construction is only anticipated to occur during in-water work windows established by IDFG, the Department, and/or the Services. The Service expects no direct lethal take of bull trout associated with project construction activities and none is authorized. Conservation measures incorporated into the Program are expected to reduce the level of anticipated take.

If the incidental take anticipated by this document (i.e., harm or harassment to bull trout within the action area during the five years of Program implementation) is exceeded, all such activities will cease and the Agencies will immediately contact the Service to determine if consultation should be reinitiated. Authorized take will be exceeded (1) if any individual Program activity results in suspended sediment exposure (concentration and duration) or sound effect levels determined to have more than minor physiological effects to bull trout within 600 feet downstream of in-stream construction sites; (2) if there is more than 300 feet of bank stabilization (i.e., riprap or gabion baskets) work for any single project or if there are more than two such bank stabilization projects per 4th Field HUC per year; (3) if instream work occurs outside of agreed upon in-water work windows; or (4) if Program activities result in any bull trout mortality.

Bull trout present in the action area may be injured or killed in the process of collecting and removing fish prior to instream work. This take has already been anticipated and analyzed in the Service's Biological Opinion for Idaho Department of Fish and Game's Scientific Collecting Permit (Fish and Wildlife Service 2000), and will not be addressed in this Opinion.

4.6.2 Effect of the Take

In the accompanying Biological Opinion, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of the bull trout across its range.

Anticipated take may be reduced because the project includes BMPs to avoid and reduce adverse effects. In addition, adverse effects will be short in duration and limited in scope. The probability that the proposed action will eliminate any local populations of bull trout is discountable. Local bull trout densities and distribution in the affected streams are not expected to be significantly altered.

4.6.3 Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of take on the bull trout.

1. Minimize the potential for disruption of bull trout habitat from project implementation.

2. Avoid impacts to bull trout spawning and early rearing areas.

4.6.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1a. As needed during dewatering, the Agencies will identify for the contractor where pump water from the dewatered area will be disposed. All necessary measures (e.g., settling ponds) will be taken to ensure that no sediment from pump water will reach the stream.

1b. All erosion and sediment control measures will be maintained until construction is complete and disturbed areas are stabilized.

2. Ensure that no Program activities occur in bull trout spawning areas.

4.6.5 Reporting and Monitoring Requirement

In order to monitor the impacts of incidental take, the Federal agency or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR 402.14 (i)(3)).

1. As part of the process for implementing the Program, the Department is required to provide appropriate post-Project Monitoring Forms to the Service within 45 days of project completion. The Department will also host an annual coordination meeting to review the projects implemented under the Program during the previous year.
2. Upon locating any dead, injured, or sick bull trout, or upon observing destruction of redds as a result of project activities such activities shall be terminated and notification must be made within 24 hours to the Service's Division of Law Enforcement at (208) 378-5333. Additional protection measures may be developed through discussions with the Service.
3. During project implementation, the Agencies shall promptly notify the Service of any emergency or unanticipated situations arising that may be detrimental for bull trout relative to the proposed activity.

4.7 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species.

1. To better assess sediment effects on bull trout from future instream projects, take suspended sediment samples at the turbidity monitoring stations established for the project. Although turbidity and suspended sediment concentration are correlated, the relationship varies between individual streams and watersheds. Measuring suspended sediment will assist in making stream-specific correlations between suspended sediment concentrations and turbidity.

2. Continue to promote recovery of bull trout in the action area by identifying habitat restoration opportunities and implementing these actions in the near-term.
3. Use native species for revegetating disturbed sites.
4. Restrict washout of concrete trucks and equipment to locations that will minimize the risk of introducing wastewater to bull trout habitat.

5. UTAH VALVATA SNAIL

5.1 Status of the Species

5.1.1 Listing Status

The Service listed the Utah valvata snail as endangered effective January 13, 1993 (57 FR 59244-59257, December 14, 1992). No critical habitat has been designated for this species. The Service also published a recovery plan for this species and four other Snake River snails (Fish and Wildlife Service 1995). The target recovery area for this species is from river mile (RM) 572 near Hagerman to RM 709, a few miles below American Falls Dam on the Snake River, and includes associated cold-water tributaries (Fish and Wildlife Service 1995, p. 30).

On July 16, 2009, the Service published a 12-month petition finding, proposing to remove the Utah valvata from the Federal List of Endangered and Threatened Wildlife (74 FR 34539-34548). As of the date of this Opinion, the Service has not published a final rule delisting the Utah valvata. The snail will remain listed as endangered until a final rule is published.

5.1.2 Reasons for Listing

Section 4 of the Act and regulations promulgated to implement the listing provisions of the Act (50 CFR part 424) set forth the procedures for adding species to the Federal list. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the Act. Three of the five factors were found to apply to the Utah valvata snail: the present or threatened destruction, modification, or curtailment of its habitat or range; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence.

Primary factors found to be threatening the Utah valvata at the time of listing include hydroelectric dam development, water withdrawals for agriculture and small hydroelectric projects, peak loading of existing hydroelectric water projects, water pollution, and exotic species invasions (e.g., New Zealand mudsnail, *Potamopyrgus antipodarum*).

Our understanding of the Utah valvata habitat requirements, range, and threats has changed since the time of listing. From studies conducted since 1992, we now know that the species occurs over a much larger geographic range in the Snake River and is able to live in a variety of aquatic habitats and is not limited to cold, fastwater, or lotic habitats, or in perennial flowing waters associated with large spring complexes as previously believed. In addition, the proposed construction of six new hydropower facilities as discussed at the time of listing is no longer a threat. The Utah valvata is now known to occur in, and persist in, aquatic habitats influenced by dam operations (e.g., reservoirs, and at elevated water temperatures), and the species co-exists in a variety of Snake River aquatic habitats with the invasive New Zealand mudsnail. We have determined that none of the existing or potential threats, either alone or in combination with others, are likely to cause the Utah valvata to become in danger of extinction within the foreseeable future throughout all or any significant portion of its range. The Utah valvata no longer requires the protection of the Act, and, therefore, we are proposing to remove it from the Federal List of Endangered and Threatened Wildlife (74 FR 34548).

5.1.3 Species Description

The shell of the Utah valvata reaches about 4 to 6 mm (0.2 in.) in height and width and is turbinate in shape. Adults have up to four whorls and the shell has a well developed umbilicus and a single raised ridge or carina that runs longitudinally along the body whorl and fades out before reaching the aperture (Walker 1902, p. 125). Empty shells are translucent to faded green or yellowish at their spire apex. Live snails appear grey to brown and are typically associated with sediment-containing aquatic habitats, including springs, rivers, lakes, and reservoirs.

5.1.4 Life History

The Utah valvata snail is univoltine (produces one group of eggs per year) with a lifespan of about 1 year. Reproduction and spawning occur asynchronously between March and October, depending on habitat, with the majority of young spawned between August and October (Cleland 1954, pp. 171-172; Bureau of Reclamation 2003, p. 7). Emergence of a new cohort follows approximately 2 weeks after oviposition (Cleland 1954, p. 170; Dillon 2000, p. 103), and senescent snails (i.e., those approximately 374 days old) die shortly after reproduction (Cleland 1954, pp. 170-171; Lysne and Koetsier 2006, p. 287).

Little is known of Utah valvata feeding habits. They have been described as detritivores (animals that feed on decomposing organic matter), ingesting diatoms, algae, and minute plant debris, and also grazing the aufwuchs (the algae, diatoms, protozoans, bacteria, and fungi that comprise the fine, slippery coating on plants and rocks in aquatic ecosystems) (Frest and Johannes 1992, p. 13-14).

At the time of listing in 1992, the best available data indicated that Utah valvata snails "characteristically require cold, fastwater, or lotic habitats …in deep pools adjacent to rapids or in perennial flowing waters associated with large spring complexes" (57 FR 59244, December 14, 1992). In numerous field studies conducted since then, the species has been collected at a wide range of depths, ranging from less than 3.2 feet (1 meter) (Stephenson and Bean 2003, pp. 98-99) to depths greater than 45 feet (14 meters) (Bureau of Reclamation 2003, p. 20), and at temperatures between 37.4 and 75.2 degrees Fahrenheit (F) (4 to 24 degrees Celsius (C)) (Lysne 2007, in litt.; Gregg 2006, in litt.).

Recent work conducted by the IDFG in the upper Snake River demonstrated that Utah valvata snail presence was positively correlated with water depth (up to 18.37 feet (5.6 meters)) and temperature (up to 63 degrees F (17.2 degrees C)) (Fields 2005, pp. 8-9). Utah valvata snail density was positively correlated with macrophyte (a water plant large enough to be observed with the unaided eye) coverage, water depth, and temperature (Fields 2006, p. 6). Similarly, Hinson (2006, pp. 28-29) analyzed available data from several studies conducted by the Bureau of Reclamation (2001-2004), Idaho Power Company (IPC) (1995-2002), IDFG, the Department (2003-2004) and others, and demonstrated a positive relationship between Utah valvata snail presence and macrophytes, depth, and fine substrates. One study reported Utah valvata snails in organically enriched fine sediments with a heavy macrophyte community, downstream of an aquaculture facility (RM 588) (Hinson 2006, pp. 31-32). Survey data and information reported since the time of listing demonstrate that the Utah valvata snail is able to live in reservoirs, which were previously thought to be unsuitable for the species (Frest and Johannes 1992, pp. 13-14; Bureau of Reclamation 2002, pp. 8-9; Fields 2005, p. 16; Hinson 2006, pp. 23-33). We now know the Utah valvata snail persists in a variety of aquatic habitats, including cold-water springs, spring creeks and tributaries, the mainstem Snake River and associated tributary stream habitats, and reservoirs.

Alterations of the Snake River, including the construction of dams and reservoir habitats, have changed fluvial processes resulting in the reduced likelihood of naturally high river flows or rapid changes in flows, and the retention of fine sediments (Environmental Protection Agency 2002, pp. 4.30-4.31), which may also increase potential habitat for the species (e.g., Lake Walcott and American Falls Reservoirs). Utah valvata snail surveys conducted downstream from American Falls Dam (RM 714.1) to Minidoka Dam (RM 674.5), from 1997 and 2001-2007, consistently found Utah valvata snails on fine sediments within this 39-mile (62.9 km) river/reservoir reach of the Snake River (Bureau of Reclamation 1997, p. 4; Bureau of Reclamation 2003, p. 8; Bureau of Reclamation 2004, p. 5; Bureau of Reclamation 2005, p. 6; Bureau of Reclamation 2007, pp. 9-11; Fish and Wildlife Service 2005, p. 119). Surveys conducted downstream of Minidoka Dam (RM 674.5) to Lower Salmon Falls Dam (RM 573.0) have detected Utah valvata snails, including one record from the tailrace area of Minidoka Dam in 2001 (Fish and Wildlife Service 2005, p. 120).

In summary, based on available information, the Utah valvata snail is not as specialized in its habitat needs as we thought at the time of listing. In the Snake River, the species inhabits a diversity of aquatic habitats throughout its 255-mile (410 km) range, including cold-water springs, spring creeks and tributaries, mainstem and freeflowing waters, reservoirs, and impounded reaches. The species occurs on a variety of substrate types including both fine sediments and more coarse substrates in areas both with and without macrophytes. It has been collected at water depths ranging from less than 3.2 feet (1 meter) to greater than 45 feet (14 meters), and at water temperatures ranging from 37.4 to 75.2 degrees F (3 to 24 degrees C).

5.1.5 Population Dynamics

The species is univoltine with a life span of about one year. The reproductive potential of the Utah valvata is unknown, but egg masses with up to 12 eggs have been observed (Lysne, 2003, p. 80). Analysis of size classes in Lake Walcott suggests that these colonies reproduce between June and September (Bureau of Reclamation 2003, pp. 10-12).

The density of Utah valvata at occupied sites can vary greatly. For example, at one cold-water spring site at the Thousand Springs Preserve, the average density in 2003 was 197 snails/square meter (sq m) (ranging between 0 and 1,724 snails/sq m) (Stephenson et al. 2004, p. 23). In the mainstem Snake River between American Falls Reservoir and Minidoka Dam in 2002, Utah valvata densities averaged 91 snails/sq m (ranging from 0 to 1,188 snails per sq m), and in American Falls Reservoir densities averaged 50 snails/sq m (range unavailable) (Bureau of Reclamation 2003, p. 20). Above American Falls Reservoir in the mainstem Snake River, Utah valvata densities at six sites averaged 117 snails/sq m (ranging from 0 to 1,716 snails/sq m) (Fields 2006, pp. 12-13).

Within reservoirs, the proportional occurrence of snails is relatively high. For all field studies and surveys, the highest proportions of samples where snails are present have been collected in lower Lake Walcott Reservoir (Bureau of Reclamation 2002, p. 5; Bureau of Reclamation 2003, p. 6). For sample years 2001 to 2006, the relative proportion of samples containing Utah valvata snails ranged from 40 (in 2004) to 62 (in 2002) percent of samples collected. Similarly, American Falls reservoir samples contain a high proportion of Utah valvata snails with 21 (in 2001) to 33 (in 2003) percent in collections between 2002 through 2004. Such high proportional occurrence in reservoirs is additional evidence that Utah valvata snails are not restricted to cold-water springs or their outflows.

5.1.6 Status and Distribution

The Utah valvata snail, or at least its closely related ancestors, has been described as ranging widely across the western United States and Canada as far back as the Jurassic Period, 199.6 +/- 0.6 to 145.5 +/- 4 million years ago (Taylor 1985a, p. 268). Fossils of the Utah valvata are known from Utah to California (Taylor 1985a, pp. 286-287). The Utah valvata was likely present in the ancestral Snake River as it flowed south from Idaho, through Nevada, and into northeastern California (Taylor 1985a, p. 303). The Snake River escaped to join the Columbia River Basin approximately 2 million years ago (Hershler and Liu 2004, pp. 927-928).

At the time of listing in 1992 (57 FR 59244, December 14, 1992) we reported the range of the Utah valvata as existing at a few springs and mainstem Snake River sites in the Hagerman Valley, Idaho (River Mile (RM) 585), a few sites above and below Minidoka Dam (RM 675), and in the American Falls Dam tailwater near Eagle Rock damsite (RM 709). Surveys at the State of Idaho's Thousand Springs Preserve (RM 585) indicated declining numbers of snails, with two colonies at or below 6,000 individuals (57 FR 59245).

New data collected since the time of listing indicate that the range of the species is discontinuously distributed in at least 255 miles (410 kilometers (km)) of the Snake River and some associated tributary streams, an increase of nearly 122 river miles (196 km) from the previously known range. Their current range in the Snake River extends from RM 585 near the Thousand Springs Preserve (Bean 2005, in litt.), upstream to the confluence of the Henry's Fork with the Snake River (RM 837; Fields 2005, p. 11). Colonies of the Utah valvata have been found in the Snake River near the towns of Firth (RM 777.5), Shelley (RM 784.6), Payne (RM 802.6), Roberts (RM 815), and in the Henry's Fork approximately 9.3 miles (15 km) upstream from its confluence with the Snake River (at Snake RM 832.3) (Gustafson 2003, in litt). Based on limited mollusk surveys, the species has not been found upstream from the described location on the Henry's Fork or in the South Fork of the Snake River. Tributary streams to the Snake River where Utah valvatas have been collected include Box Canyon Creek (RM 588) (Taylor 1985b, pp. 9-10), and at one location in the Big Wood River (WRM 35) (Bureau of Reclamation 2003, p. 22). Big Wood River observations require further investigation and may be the result of seasonal transport of Utah valvata snails via irrigation canals that connect the Big Wood and Snake Rivers, or passive transport via waterfowl (Miller et al. 2006, p. 2371) between large bodies of water (i.e., reservoirs).

5.1.7 Conservation Needs

For Utah valvata to be recovered, viable subpopulations need to be sustained and protected in suitable habitats from RM 572 to 709; securing upstream populations in American Falls Reservoir and the lower Henry's Fork would enhance the species survival and recovery. Suitable habitats have mud or sand substrates throughout the river profile and adjacent springs; have good water quality; temperatures below 18.5 °C; dissolved oxygen concentrations above 6 milligrams per liter; and pH levels between 6.5 and 9.5. Presently occupied habitats should be conserved, and threats such as dewatering and degraded water quality should be managed and minimized (Fish and Wildlife Service 1995, p. 29).

5.1.8 Critical Habitat

No critical habitat has been designated for the Utah valvata.

5.2 Environmental Baseline of the Action Area

This section assesses the effects of past and ongoing human and natural factors that have led to the current status of the species, its habitat and ecosystem in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with the consultations in progress.

5.2.1 Status of the Utah Valvata in the Action Area

The Program may potentially affect Utah valvata throughout its range, from the Henry's Fork downstream to the middle Snake River in the Thousand Springs area. Specifically, the Utah valvata may be affected by Program actions occurring within Department right-of-ways near the Snake River. This area is encompassed by Department District 4 (Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls Counties); District 5 (Bannock, Binham, Cassia, and Power Counties); and District 6 (Bingham, Blaine, Bonneville, Fremont, Jefferson, and Madison Counties).

5.2.2 Factors Affecting the Utah Valvata in the Action Area

Primary factors threatening the Utah valvata in the action area include hydroelectric dam development, water withdrawals for agriculture and small hydroelectric projects, peak loading of existing hydroelectric water projects, water pollution, and exotic species invasions (e.g., New Zealand mudsnail, *Potamopyrgus antipodarum*).

5.3 Effects of the Proposed Action

The implementing regulations for section 7 define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline" (50 CFR § 402.02). "Indirect effects" are caused by or result from the agency action, are later in time, but are still reasonably certain to occur. Indirect effects may occur outside of the immediate footprint of the project area, but would occur within the action area as defined (50 CFR § 402.02).

5.3.1 Direct and Indirect Effects of the Proposed Action

Program actions involving in-water work or work below the OHWM may have adverse effects to snails and their habitats. These activities could result in erosion and sediment delivery to the Snake River, its tributaries or adjacent cold water springs complexes. These effects can degrade or inundate habitat used by snails during all life history phases, could reduce food abundance, and could cause snail mortality. Bank stabilization actions (e.g., rip-rap, gabion baskets) conducted below the OHWM may also crush and kill snails. We expect the BMPs incorporated into the Program to reduce the magnitude and severity of these potential impacts to snails, but not to a level of insignificance. The delivery of contaminants such as fuel, oil, or concrete washout water to Utah valvata habitat during implementation of Program actions may also impact snails. However, with implementation of the BMPs we expect these effects to be insignificant. The Program will not appreciably reduce the likelihood of both the survival and recovery of this species.

It should be noted that due to the programmatic nature of the proposed action, we lack site specificity regarding potential effects to the Utah valvata. We will be able to better address potential effects during the pre-project review process where the Agencies provide site-specific information for each proposed Program action. The Service can then ensure consistency with the analyses and conclusions included in this Opinion. If the pre-project review identifies that a Program action is not consistent with our Opinion, that action will need to undergo a separate section 7 consultation.

5.3.2 Effects of Interrelated or Interdependent Actions

The Service has not identified any effects from interrelated or interdependent actions.

5.4 Cumulative Effects

The implementing regulations for section 7 define cumulative effects to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Local government and private irrigation diversions from Milner Pool are anticipated to range from less than 44 to approximately 89 percent of the total water removed from the river channel (Snake River) at that point. These withdrawals have a significant effect on water quantity and quality downstream from Milner Dam both from removal of water from the river and from the return of water to the river that has been degraded (e.g., irrigation returns). It is anticipated that these cumulative impacts to water quality and quantity downstream from Milner Dam will persist into the future and that water quality could become more degraded as this region undergoes continuing development.

Throughout the Utah valvata's range, State, local, and private activities will continue to negatively affect snail habitats. These activities include destruction or modification of spring habitats that provide sources of relatively good water quality at various locations along the Snake River; reduced water quality in the Snake River due to agriculture and urban uses (*e.g.*, runoff of pesticides, fertilizers, municipal water treatment systems, toxicant spills, and other sources of pollutants); withdrawal of water for irrigation under natural flow rights; and residential and commercial development projects.

Aquifer springs provide recharge to the Snake River at numerous locations along its length and within the range and recovery area of the Utah valvata in the action area. These springs provide large volumes of cold water of relatively high quality throughout the year. Nonetheless, water quantity and quality from these springs show signs of decline. Much of this is likely a cause of agricultural practices, particularly water withdrawals due to groundwater pumping for irrigation, and leeching of agricultural chemicals and animal wastes into the aquifer. Aquifer recharge programs and other steps are currently being taken to slow or stop aquifer depletion. However, depletion and eutrophication are expected to continue as the human population and water demands continue to grow in southern Idaho. These factors will likely result in the continued degradation of habitats in the Snake River, which will continue to limit available habitat for the Utah valvata.

5.5 Conclusion

The Service has reviewed the current status of the Utah valvata, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for the species, therefore none will be affected.

While some individuals may be killed as a result of the Program and others disturbed, any impacts will be limited in duration and spatial extent and will not amount to an appreciable change in the status, distribution, or long-term persistence of the species. Additionally, Program BMPs are expected to reduce the magnitude of any adverse impacts to the Utah valvata. Any adverse effects are not expected to appreciably reduce the likelihood of survival and recovery of Utah valvata rangewide in terms of numbers, distribution, or reproduction of the species.

5.6 Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without specific exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of take in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying these species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Agencies have a continuing duty to regulate the activity covered by this incidental take statement. If the Agencies fail to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Agencies must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

5.6.1 Amount or Extent of Take Anticipated

Program actions involving in-water work or work below the OHWM may harm or kill individual Utah valvata snails. But the Service expects there will be few Program actions that will impact the Utah valvata during the five years of Program implementation. In addition, the BMPs incorporated into the Program are designed to reduce impacts to the Utah valvata. Given these considerations, the amount of take in the form of harm or mortality is expected to be low. Quantifying take is difficult because the exact location of Program actions is not known and the number of snails at any given site is also unknown (surveys show snail densities may range from 50 snails/sq m (range unavailable) to 197 snails/sq m (range 0 – 1724 snails/sq m). We will therefore use the amount of affected habitat as a surrogate for anticipated take. We predict that all snails within an area 600 feet directly downstream of any in-channel Program work will be harmed from elevated suspended and deposited sediment. Authorized take will be exceeded for any individual in-channel project if the downstream extent of suspended or deposited sediment exceeds 600 feet.

We also predict that all snails in the immediate vicinity of Program bank stabilization work conducted below the OHWM will be harmed or killed. The linear extent of bank stabilization work at any given location is not known. However, no individual project will be more than 300 feet in length and there will be no more than two bank armoring projects approved in any subbasin (4^{th} Field HUC) per year. Therefore, authorized take will be exceeded if any individual project is longer than 300 feet or if there are more than two projects per year in any subbasin inhabited by the Utah valvata.

5.6.2 Effect of the Take

The Utah valvata is documented to occur in the Snake River basin of southern Idaho from the lower Henry's Fork as far downstream as Grandview, and estimated densities throughout its range vary widely. It is not certain that snails will be present in the vicinity of any given Program action, but it is reasonable to assume they will be. The amount of habitat that will be lost or impacted as a result of the proposed Program represents a small amount of occupied and available habitats. Further, the number of individuals expected to be killed as a result of the Program is small relative to total population numbers for the species. Given the relatively small area expected to be impacted within the area known or potentially occupied by the species, it is unlikely that the loss of any snails present in the Program area would have an appreciable effect on survival and recovery of Utah valvata. In addition, it is likely that any remaining habitat within the Program area will be recolonized by Utah valvata from adjacent colonies following completion of individual Program actions (although the time required for complete recolonization is unknown). As such, take in the form of mortality and harm may occur but is not expected to jeopardize or appreciably diminish overall numbers, distribution, or reproduction to the extent that it would influence persistence of the Utah valvata into the future.

5.6.3 Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of take on the Utah valvata.

1. Minimize the potential for disrupting Utah valvata habitat from Program implementation.
2. Minimize the risk of harm and mortality to the Utah valvata.

5.6.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1a. As needed during any dewatering, the Agencies will identify for contractors where pump water from the dewatered area will be disposed. All necessary measures (e.g., settling ponds) will be taken to ensure that no sediment from pump water will reach Utah valvata habitat.

1b. All erosion and sediment control measures will be maintained until construction is complete and disturbed areas are stabilized.

2. Prior to conducting any in-channel or bank stabilization work in Utah valvata habitat, contact the Service for additional specific information on the distribution of Utah valvata and the need for implementing additional protection measures.

5.6.5 Reporting and Monitoring Requirement

In order to monitor the impacts of incidental take, the Federal agency or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR 402.14 (i)(3).

1. As part of the process for implementing the Program, the Department is required to provide appropriate post-Project Monitoring Forms to the Service within 45 days of project completion. The Department will also host an annual coordination meeting to review the projects implemented under the Program during the previous year.
2. During project implementation, the Agencies shall promptly notify the Service of any emergency or unanticipated situations arising that may be detrimental for the Utah valvata relative to the proposed Program.

5.7 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species.

1. Whenever concrete is used, restrict washout of concrete trucks and equipment to locations that will minimize the risk of introducing wastewater to Utah valvata habitat.
2. Take all necessary precautions to avoid introducing petroleum contaminants to Utah valvata habitat.

6. SNAKE RIVER PHYSA SNAIL

6.1 Status of the Species

6.1.1 Listing Status

The Snake River physa snail was listed endangered on December 12, 1992 (57 FR 59244).

6.1.2 Reasons for Listing

Section 4 of the Act and regulations promulgated to implement the listing provisions of the Act (50 CFR part 424) set forth the procedures for adding species to the Federal list. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the Act. Three of the five factors apply to Snake River physa: the present or threatened destruction, modification, or curtailment of its habitat or range; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence.

Primary factors threatening Snake River physa include hydroelectric dam development, water withdrawals for agriculture and small hydroelectric projects, peak loading of existing hydroelectric water projects, water pollution, and exotic species invasions (e.g., New Zealand mudsnail, *Potamopyrgus antipodarum*).

6.1.3 Species Description

The shells of adult Snake River physa snails are 7 mm long with 3 to 3.5 whorls, and are amber to brown in color (Fish and Wildlife Service 1995, p. 8). The aperture whorl is inflated relative to most other Physidae in the Snake River. This species occurs within the Snake River on gravel to boulder substrates, in habitats with low-to-moderate current, typically in deeper portions of the river.

6.1.4 Life History

Very little is known about the life history of the Snake River physa snail. This species existed in the Pleistocene-Holocene lakes and rivers of northern Utah and southeastern Idaho, and is thought to have persisted for at least 3.5 million years in the Snake River (Taylor 1988, p. 72). Taylor had described this species as occurring in deep river habitats dominated by rapids and boulders, but recent studies conducted by the Bureau of Reclamation below Minidoka Dam have recovered the species from river and pool (below spillway) habitats with moderate water velocity. Collections of this snail downstream of C.J. Strike Reservoir are consistent with the habitats in the Minidoka area. Snails collected from the river were typically found in deeper areas of runs and glides where the gravel to boulder substrates were mostly free of fine sediments. The more common physid species, *Physa gyrina*, was found to be more common in side channels and shallow shore-line areas, but the two species were not typically found to occur together. The Snake River physa has not been recorded from reservoirs. Based on the life histories of other physid species, the Snake River physa likely lives for up to, or just over, one year.

6.1.5 Population Dynamics

Nothing is known of the Snake River physa's population size or natural population dynamics. Like other species in the Physidae, the Snake River physa is likely univoltine, a generation of snails persisting and reproducing in the course of a single year. No demographic studies have been conducted. The highest density population appears to be in the river reach between Minidoka Dam and Milner Reservoir, with a lower density population occurring downstream of C.J. Strike Reservoir.

6.1.6 Status and Distribution

The species is only known from the Snake River in south-southwest Idaho, with limited specimens recorded from a single major tributary (i.e., the Bruneau arm of C.J. Strike Reservoir). The Service (1995, p. 8) reported that the Snake River physa's "modern" range extended from Grandview (RM 487) to the Hagerman Reach (RM 573). Recently identified specimens collected by the Bureau of Reclamation (Kerans and Gates 2006, entire) and Idaho Power Company from 1995 to 2003 (Keebaugh 2009, pp. 1-124) confirm its distribution to as far upstream as Minidoka Dam (RM 675) and as far downstream as Ontario (RM 368), Oregon, some 128 miles downstream of its previously recognized downstream extent (Grandview). Two specimens were recovered from the Bruneau River arm (RM 4) of C.J. Strike Reservoir (Keebaugh 2009, p. 123) representing the only tributary of the Snake River from which the species has been recorded. A recent review of the Idaho Power Company specimens has called into question the identity of some of these specimens. The Idaho Power Company and the Service are currently investigating this apparent confusion. However, the current information on the species suggests it has a wider distribution than previously thought, though it is extremely patchy and/or absent from large portions of this range.

While the species is more widespread than previously thought, currently recorded from an estimated 307 river miles, it has not been found at high densities within much of its current, known range and is likely absent from portions of the river. The most extensive surveys conducted to date are from the 6 mile reach below Minidoka Dam (RM 669-675) (Kerans and Gates 2006, entire) in which live Snake River physa were recovered in 29 (8 percent) of 365 samples collected. In plots where they were found, densities were typically ≤ 32 per square meter, but live animals reached relatively high densities in a few of these samples, estimated at 40 to 64 individuals per square meter. Elsewhere in the Snake River, surveys have been much less intensive and not specific to Snake River physa. Of 758 samples reexamined by Keebaugh (2009) between river miles 200 and 589.2, 4.5 percent (n=34) contained Snake River physa. Of those, 67 percent (n=23) contained a single animal and one sample near Marsing, Idaho (RM 421) contained a high of seven individuals, extrapolating to a density of 28 per square meter. Hence, in habitats sampled in the lower Snake River, the species is not regarded as ubiquitous or abundant, and is patchily distributed. As stated above, the identity of some of these specimens has been questioned. River reaches upstream of the Hagerman area (est. RM 590) through Milner Reservoir (est. RM 663) have not received systematic surveys or reexamination of previously collected materials.

6.1.7 Conservation Needs

The Service (1995) has published a final, approved recovery plan for the Snake River physa. For the Snake River physa to recover to self-sustaining levels, viable subpopulations/colonies must become established and be protected in lotic (riverine) habitats on the mainstem Snake River from RM 553 to 675 on rock/boulder substrates in deep water at the margins of rapids with good water quality (average water temperature below 18 ° C with dissolved oxygen concentrations greater than 6 milligrams per liter and pH levels of 6.5 to 9.0). River flows need to be managed, to the extent possible, to mimic a large river with natural flows and high water quality.

6.1.8 Critical Habitat

No critical habitat has been designated for the Snake River physa.

6.2 Environmental Baseline of the Action Area

This section assesses the effects of past and ongoing human and natural factors that have led to the current status of the species, its habitat and ecosystem in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with the consultations in progress.

6.2.1 Status of the Snake River physa in the Action Area

The Program may potentially affect the Snake River physa throughout its range. Specifically, the Snake River physa may be affected by Program actions occurring within Department right-of-ways near the Snake River. This area is encompassed by Department District 3 (Elmore and Owyhee Counties); District 4 (Cassia, Elmore, Gooding, Jerome, Minidoka, and Twin Falls Counties); and District 5 (Cassia County).

6.2.2 Factors Affecting the Snake River physa in the Action Area

The free-flowing, cold water environments where the Snake River physa evolved have been negatively impacted by anthropogenic activities throughout its range. Development of water impoundments and hydroelectric dams has changed the fundamental character of the Snake River. This has resulted in fragmentation of previously continuous river habitat, affected fluvial and energy flow dynamics (Sheldon and Walker 1997, p. 97; Osmundson et al. 2002, pp. 1733-1737), and contributed to the degradation of water quality. In addition to the loss of habitat and isolation effects posed by dams, hydropower operations, specifically load following, are documented to have negative impacts to aquatic species occupying habitats downstream of such facilities (Fisher and LaVoy 1972, pp. 1473-1476; Kroger 1973, pp. 478-481; Brusven et al. 1974, pp. 77-78; Brusven and MacPhee 1976, p. iv; Gersich 1980, p. 3; Morgan et al. 1991, p. 419; Christman et al. 1996, pp. 59-62). Water withdrawals for agriculture also affect the Snake River physa by reducing both the quality and quantity of water available for the snail.

6.3 Effects of the Proposed Action

The implementing regulations for section 7 define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline" (50 CFR § 402.02). "Indirect effects" are caused by or result from the agency action, are later in time, but are still reasonably certain to occur. Indirect effects may occur outside of the immediate footprint of the project area, but would occur within the action area as defined (50 CFR § 402.02).

6.3.1 Direct and Indirect Effects of the Proposed Action

Program actions involving in-water work or work below the OHWM may have adverse effects to snails and their habitats. These activities could result in erosion and sediment delivery to the Snake River, its tributaries or adjacent cold water springs complexes. These effects can degrade or inundate habitat used by snails during all life history phases, could reduce food abundance and could cause snail mortality. Bank stabilization actions (e.g., rip-rap, gabion baskets) conducted below the OHWM may also crush and kill snails. We expect the BMPs incorporated into the Program to reduce the magnitude and severity of these potential impacts to snails, but not to a level of insignificance. The delivery of contaminants such as fuel, oil, or concrete washout water to Snake River physa habitat during implementation of Program actions may also impact snails. However, with implementation of the BMPs we expect these effects to be insignificant. The Program will not appreciably reduce the likelihood of both the survival and recovery of this species.

It should be noted that due to the programmatic nature of the proposed action, we lack site specificity regarding potential effects to the Snake River physa. We will be able to better address potential effects during the pre-project review process where the Agencies provide site-specific information for each proposed Program action. The Service can then ensure consistency with the analyses and conclusions included in this Opinion. If the pre-project review identifies that a Program action is not consistent with our Opinion, that action will need to undergo a separate section 7 consultation.

6.3.2 Effects of Interrelated or Interdependent Actions

The Service has not identified any effects from interrelated or interdependent actions.

6.4 Cumulative Effects

The implementing regulations for section 7 define cumulative effects to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Local government and private irrigation diversions from Milner Pool are anticipated to range from less than 44 to approximately 89 percent of the total water removed from the river channel at that point. These withdrawals have a significant effect on water quantity and quality downstream from Milner Dam both from removal of water from the river and from the return of water to the river that has been degraded (e.g., irrigation returns). It is anticipated that these cumulative impacts to water quality and quantity downstream from Milner Dam will persist into the future and that water quality could become more degraded as this region undergoes continuing development.

Throughout the Snake River physa's range, State, local, and private activities will continue to negatively affect snail habitats. These activities include destruction or modification of spring habitats that provide sources of relatively good water quality at various locations along the Snake River; reduced water quality in the Snake River due to agriculture and urban uses (*e.g.*, runoff of pesticides, fertilizers, municipal water treatment systems, toxicant spills, and other sources of pollutants); withdrawal of water for irrigation under natural flow rights; and residential and commercial development projects.

Aquifer springs provide recharge to the Snake River at numerous locations along its length and within the range and recovery area of the Snake River physa in the action area. These springs provide large volumes of cold water of relatively high quality throughout the year. Nonetheless, water quantity and quality from these springs show signs of decline. Much of this is likely due to agricultural practices, particularly water withdrawals due to groundwater pumping for irrigation, and leeching of agricultural chemicals and animal wastes into the aquifer. Aquifer recharge programs and other steps are currently being taken to slow or stop aquifer depletion. However, depletion and eutrophication are expected to continue as the human population and water demands continue to grow in southern Idaho. These factors will likely result in the continued degradation of habitats in the Snake River, which will continue to limit available habitat for the Snake River physa.

6.5 Conclusion

The Service has reviewed the current status of the Snake River physa, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to jeopardize the species continued existence. No critical habitat has been designated for the species, therefore none will be affected.

While some individuals may be killed as a result of the action and others disturbed, any impacts will be limited in duration and spatial extent and will not amount to an appreciable change in the status, distribution, or long-term persistence of the species. The adverse effects are not expected to appreciably reduce the likelihood of survival and recovery of the Snake River physa rangewide in terms of numbers, distribution, or reproduction of the species.

6.6 Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without specific exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of take in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying these species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Agencies have a continuing duty to regulate the activity covered by this incidental take statement. If the Agencies fail to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Agencies must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

6.6.1 Amount or Extent of Take Anticipated

Program actions involving in-water work or work below the OHWM may harm or kill individual Snake River physa snails. But the Service expects there will be few Program actions that will impact the Snake River physa during the 5 years of Program implementation. In addition, the BMPs incorporated into the Program are designed to reduce impacts to the Snake River physa. Given these considerations, the amount of take in the form of harm or mortality is expected to be low. Quantifying take is difficult because the exact location of Program actions is not known and the number of snails at any given site is also unknown (surveys show that snail densities range from less than 32 snails per sq m to 64 snails per sq m and some samples contained only a single snail). We will therefore use the amount of affected habitat as a surrogate for anticipated take. We predict that all snails within an area 600 feet directly downstream of any in-channel Program work will be harmed from elevated suspended and deposited sediment. Authorized take will be exceeded for any individual in-channel project if the downstream extent of suspended or deposited sediment exceeds 600 feet.

We also predict that all snails in the immediate vicinity of Program bank stabilization work conducted below the OHWM will be harmed or killed. The linear extent of bank stabilization work at any given location is not known. However, no individual project will be more than 300 feet in length and there will be no more than two bank armoring projects approved in any subbasin (4th Field HUC) per year. Therefore, authorized take will be exceeded if any individual project is longer than 300 feet or if there are more than two projects per year in any subbasin inhabited by the Snake River physa.

6.6.2 Effect of the Take

The Snake River physa is documented to occur in the Snake River basin of southern Idaho from as far upstream as Minidoka Dam (RM 675) and as far downstream as Ontario (RM 368), Oregon, and estimated densities throughout its range vary widely due to their patchy distribution. It is not certain that snails will be present in the vicinity of any given Program action , but it is reasonable to assume they will be. The amount of habitat that will be lost or impacted as a result of the proposed Program represents a small amount of occupied and available habitats. Further, the number of individuals expected to be killed as a result of the Program is small relative to total population numbers for the species. Given the relatively small area expected to be impacted within the area known or potentially occupied by the species, it is unlikely that the loss of any snails present in the Program area would have an appreciable effect on survival and recovery of the Snake River physa. In addition, it is likely that any remaining habitat within the Program area will be recolonized by the Snake River physa from adjacent colonies following completion of individual Program actions. As such, take in the form of mortality and harm may occur but is not expected to jeopardize or appreciably diminish overall numbers, distribution, or reproduction to the extent that it would influence persistence of the Snake River physa into the future.

6.6.3 Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of take on the Snake River physa.

1. Minimize the potential for disrupting Snake River physa habitat from Program implementation.
2. Minimize the risk of harm and mortality to the Snake River physa.

6.6.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1a. As needed during any dewatering, the Agencies will identify for contractors where pump water from the dewatered area will be disposed. All necessary measures (e.g., settling ponds) will be taken to ensure that no sediment from pump water will reach Snake River physa habitat.

1b. All erosion and sediment control measures will be maintained until construction is complete and disturbed areas are stabilized.

2. Prior to conducting any in-channel or bank stabilization work in Snake River physa habitat contact the Service for additional specific information on the distribution of the Snake River physa and the need for implementing additional protection measures.

6.6.5 Reporting and Monitoring Requirement

In order to monitor the impacts of incidental take, the Federal agency or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR 402.14 (i)(3).

1. As part of the process for implementing the Program, the Department is required to provide appropriate post-Project Monitoring Forms to the Service within 45 days of project completion. The Department will also host an annual coordination meeting to review the projects implemented under the Program during the previous year.
2. During project implementation, the Agencies shall promptly notify the Service of any emergency or unanticipated situations arising that may be detrimental for the Snake River physa relative to the proposed Program.

6.7 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species.

1. Whenever concrete is used, restrict washout of concrete trucks and equipment to locations that will minimize the risk of introducing wastewater to Snake River physa habitat.
2. Take all necessary precautions to avoid introducing petroleum contaminants to Snake River physa habitat.

7. BLISS RAPIDS SNAIL

7.1 Status of the Species

7.1.1 Listing Status

The Bliss Rapids snail was listed as threatened on December 12, 1992 (57 FR 59244). On December 26, 2006, the Service received a petition from the Governor of Idaho and the Idaho Power Company to delist the Bliss Rapids snail. On September 16, 2009, we published a 12-month finding concluding that delisting the Bliss Rapids was not warranted (74 FR 47536). Based on a thorough review of the best scientific and commercial data available, we determined that the species continues to be restricted to a small geographic area in the middle-Snake River, Idaho, where it is dependent upon cool-water spring outflows. Although some threats identified at the time of listing in 1992 no longer exist or have been moderated, ground water depletion and impaired water quality still threaten the Bliss Rapids snail. In addition, there are significant uncertainties about the effects of hydropower operations and New Zealand mudsnails on the persistence of Bliss Rapids snails in riverine habitats. In the absence of the Act's protections, existing regulations are not likely to be sufficient to conserve the species. Given our current understanding of the species' geographic distribution, habitat requirements, and threats, the species continues to meet the definition of a threatened species under the Act.

7.1.2 Reasons for Listing

Section 4 of the Act and regulations promulgated to implement the listing provisions of the Act (50 CFR part 424) set forth the procedures for adding species to the Federal list. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the Act. Three of the five factors apply to the Bliss Rapids snail: the present or threatened destruction, modification, or curtailment of its habitat or range; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence. As discussed above, in our 12-month finding on a petition to delist the species we found that some of these factors no longer exist or have been moderated, but ground water depletion and impaired water quality still threaten the Bliss Rapids snail (74 FR 47536).

7.1.3 Species Description

The shells of adult Bliss Rapids snails are 0.08 to 0.16 inches long with 3.5 to 4.5 whorls, and are clear to white when empty (Hershler et al. 1994, pg. 235). The species can occur in two different color morphs, the white or pale form, or the red form (Hershler et al. 1994, p. 240). It is not known what controls these color forms, but some populations do contain more than one color form. This species typically occurs on the lateral and underside of gravel- to boulder-sized substrate in moderate currents in the main stem of the Snake River, as well as within numerous springs and spring tributaries that empty into the Snake River (Frest and Johannes 1992, p. 22; Hershler et al. 1994, p. 237). The species has not been found in impounded reaches of the Snake River (Frest and Johannes 1992, p. 23; Richards et al. 2006, p. 35) nor in river habitats upstream of the Upper Salmon Falls Dam (RM 581.5).

7.1.4 Life History

The Bliss Rapids snail is typically found on the lateral and undersides of clean cobbles in pools, eddies, runs, and riffles, though it may occasionally be found on submerged woody debris (Hershler et al. 1994, p. 239) where it is a periphyton (benthic diatom mats) grazer (Richards et al. 2006, p. 59). This species is restricted to spring-influenced bodies of water within and associated with the Snake River from King Hill (RM 546) to Elison Springs (RM 604). The snail's distribution within the Snake River is within reaches that are unimpounded and receive significant quantities (ca. 5,000 cfs) of recharge from the Snake River Plain Aquifer (Clark and Ott 1996, p. 555; Clark et al. 1998, p. 9). It has not been recovered from impounded reaches of the Snake River, but can be found in spring pools or pools with evident spring influence (Hopper, Service, in litt. 2006). With few exceptions, the Bliss Rapids snail has not been found in sediment-laden habitats, typically being found on, and reaching its highest densities on clean, gravel to boulder substrates in habitats with low to moderately swift currents, but typically absent from whitewater habitats (Hershler et al. 1994, p. 237). Difficulties rearing this species in a laboratory setting (Warbritton, 2009), along with its natural distribution within spring-influenced waters suggest it requires cool waters of relatively high or specific quality.

7.1.5 Population Dynamics

Bliss Rapids snails are dioeceous, having separate sexes. Fertilization is internal and eggs are laid singly within a capsule on rock or other hard substrates (Hershler et al. 1994, p. 239). Individual, life-time fecundity is not known, but deposition of 5-12 eggs per cluster, have been observed in laboratory conditions (Richards et al. 2009b, p. 26). Reproductive phenology probably differs between habitats and has not been rigorously studied in the wild. Hershler et al. (1994, p. 239) stated that reproduction occurred from December through March, but a more thorough investigation by Richards (2004, p. 135) suggested a bimodal phenology with spring and fall peaks, but with some recruitment occurring throughout the year, although his findings are restricted to a small number of spring populations.

It is difficult to estimate the density and relative abundance of Bliss Rapids snail colonies. The species is documented to reach high densities in cold-water springs and tributaries in the Hagerman reach of the middle Snake River (Stephenson and Bean 2003, pp. 12, 18; Stephenson et al. 2004, p. 24), whereas colonies in the mainstem Snake River (Stephenson and Bean 2003, p. 27; Stephenson et al. 2004, p. 24) tend to have lower densities (Richards et al. 2006, p. 37). Bliss

Rapids snail densities in Banbury Springs averaged approximately 32.53 snails per square foot (350 snails per square meter) on three habitat types (vegetation, edge, and run habitat as defined by Richards et al. 2001, p. 379). Densities greater than 790 snails per square foot (5,800 snails per square meter) have been documented at the outlet of Banbury Springs (Morgan Lake outlet) (Richards et al. 2006, p. 99).

In an effort to account for the high variability in snail densities and their patchy distribution, researchers have used predictive models to give more accurate estimates of population size in a given area (Richards 2004, p. 58). In the most robust study to date, predictive models estimated between 200,000 and 240,000 Bliss Rapids snails in a study area measuring 58.1 square feet (625 square meters) in Banbury Springs, the largest known colony (Richards 2004, p. 59). Due to data limitations, this model has not been used to extrapolate population estimates to other spring complexes, tributary streams, or mainstem Snake River colonies. However, with few exceptions (i.e., Thousand Springs and Box Canyon), Bliss Rapids snail colonies are much smaller in areal extent than the colony at Banbury Springs, occupying only a few square feet.

This difference in snail density between spring and riverine habitats is most likely due to the stable environmental conditions of these aquifer springs, which provide steady flows of stable temperatures and consistent water quality. Despite the high densities reached within springs, Bliss Rapids snails may be absent from springs or absent from portions of springs with otherwise uniform water quality conditions. The reasons for this patchy distribution is uncertain but may be attributable to factors such as habitat quality, competition from species such as the New Zealand mudsnail (Richards 2004), elevated water velocity, or historical events that had eliminated Bliss Rapids snails in the past.

By contrast, river-dwelling populations are subjected to highly variable river dynamics where flows and temperatures can vary by a magnitude, and water quality from human activities can vary greatly seasonally depending on human and natural factors. These river and anthropogenic processes probably play a major role in controlling snail populations within the Snake River. While Bliss Rapids snails may reach moderate densities (10s-100s) at some locations, they are more frequently found at low densities (Richards and Arrington 2009, p. 23; Richards et al. 2009a, pp. 35-39) if they are present. It is likely that annual river processes play a major role in the distribution of Bliss Rapids snails throughout their range within the Snake River, killing and moving snails and greatly altering the benthic habitat.

A genetic analysis of Bliss Rapids snails throughout their range (Liu and Hershler 2009, p. 1294) indicated that spring populations were largely or entirely sedentary, with little to no movement between springs or between springs and river populations. By contrast, river populations exhibited no clear groupings, suggesting that this population is genetically mixed (Liu and Hershler 2009, p. 1295).

7.1.6 Status and Distribution

At the time of listing in 1992, the distribution of the Bliss Rapids snail was thought to be discontinuous over 204 miles of the Snake River in Idaho, between King Hill (river mile (RM) 546) and Lower Salmon Falls Dam (RM 573) with a disjunct occurrence at RM 749. The species' distribution upstream of Upper Salmon Falls Reservoir was known to be localized to spring complexes (i.e., Thousand Springs (RM 585), Minnie Miller Springs (RM 585), Banbury Springs (RM 589), Niagara Springs (RM 599), and Box Canyon Springs (RM 588)) (57 FR

59244). This range was based on approximately 14 spring/tributary collection points (Richards et al. 2006, p. 33). The reported occurrence at RM 749 is now regarded as erroneous because: (1) samples from this collection have not been located to verify the occurrence (Frest 2002, in litt.); (2) the reported collection site is 150 river miles upstream of the known distribution of the species (Pentec 1991 in 57 FR 59244); and, (3) numerous collection efforts in and above American Falls Reservoir (Bureau of Reclamation 2003; Bureau of Reclamation 2004; Bureau of Reclamation 2005; Gregg 2006, in litt.), and in the upper Snake River (Fields 2006, pp. 1-34) have all failed to document the occurrence of the species.

The current known range of the Bliss Rapids snail is similar to what was described at the time of listing (minus the erroneous location at American Falls Reservoir). Increased sampling effort has documented its presence at many more locations within its range. Based on 837 sample events conducted by the Idaho Power Company (IPC), the Bliss Rapids snail is documented to occur within the non-reservoir sections of the middle Snake River from approximately RM 547 to RM 572, and RM 580 (Richards et al. 2006, pp. 33-38). This represents a refined distribution since the time of listing in 1992 due to more accurate survey data.

Bliss Rapids snails are also known to occur in 14 springs or Snake River tributary streams (from RM 552.8 to RM 604.5) derived from cold water springs including: Bancroft Springs; Thousand Springs and Minnie Miller Springs (Thousand Springs Preserve); Banbury Springs; Niagara Springs; Crystal Springs; Briggs Springs; Blue Heart Springs; Box Canyon Creek; Riley Creek; Sand Springs Creek; Elison Springs; the Malad River; Cove Creek (a tributary to the Malad River); and the headwater springs to Billingsley Creek (Richards et al. 2006, p. 2; Fish and Wildlife Service 2008a, p. 6).

The U.S. Geological Survey (USGS) reported finding several Bliss Rapids snails at Blue Lakes (approximately Snake River mile 610.4) in 1994, but surveys of this site in 1996 and 2007 did not locate the species (Mebane 2007, Grotheer 2008). Over 200 springs or spring clusters have been mapped or identified on the north side of the Snake River canyon (Clark and Ott 1996, p. 559) where the Bliss Rapids snail has been documented to occur. Springs also occur on the south side of the Snake River canyon (Clark and Ott 1996, p. 559), but studies conducted by the Idaho Power Company (IPC) have not observed Bliss Rapids colonies in springs or tributaries on the south side (Bates and Richards 2008, in litt.). The species is likely present at additional springs on private lands that have not been sampled (e.g., Hopper 2006, in litt.).

In summary, we now know the Bliss Rapids snail to be distributed discontinuously over 22 miles, from RM 547-560, RM 566-572, and at RM 580 on the Snake River and to occur in 14 springs or tributaries to the Snake River. The area between RM 561-565 represents reservoir areas where the Bliss Rapids snail does not occur. The species' overall geographic range has not substantially changed since it was first described by Hershler et al. (1994, pp. 233-242), but the species has been detected at more locations within its range.

7.1.7 Conservation Needs

Given the known limited distribution of the Bliss Rapids snail and its specific habitat requirements, maintaining or improving spring and river habitat conditions within its range is the primary need for this species to survive and recover.

The Bliss Rapids snail reaches its highest densities in cold-water springs dominated by cobble substrates and free, or relatively free, of fine sediments, and with good water quality. Protecting these habitats that contain Bliss Rapids snail populations is critical to their survival and recovery.

Ensuring that water quality within the Snake River is not degraded is important for sustaining the species' river-dwelling populations. Since water quality appears to be of crucial importance, protection of the Snake River Plain Aquifer is a priority since it is the source of water for the springs occupied by the snail and serves a major role in maintaining river water quality within the species' range.

7.1.8 Critical Habitat

The Service has not designated any critical habitat for the Bliss Rapids snail.

7.2 Environmental Baseline of the Action Area

This section assesses the effects of past and ongoing human and natural factors that have led to the current status of the species, its habitat and ecosystem in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with the consultations in progress.

7.2.1 Status of the Bliss Rapids Snail in the Action Area

The Program may potentially affect the Bliss Rapids snail throughout its range. Specifically, the Bliss Rapids snail may be affected by Program actions involving in-water work occurring within Department right-of-ways near the Snake River. This area is encompassed by Department District 3 (Elmore County) and District 4 (Elmore, Gooding, Jerome, and Twin Falls Counties).

7.2.2 Factors Affecting the Bliss Rapids Snail in the Action Area

The primary threats to this species are from water quality degradation, groundwater pumping, and invasive species. Recent work has established that while hydroelectric operations do impact river populations, those impacts are small relative to the size and range of that/those populations and not likely to diminish the species' chance of recovery. Degraded water quality from human activities both in the Snake River as well as the Snake River Plain Aquifer, are impending threats and are not likely to diminish substantially in the near future. While efforts have been made to reduce pollutants to the Snake River, there has also been increased human growth in the area and a significant increase in some agricultural activities that pose serious threats to water quality (Clark and Ott 1996, p. 555; Clark et al. 1998, p. 7). Groundwater pumping of the Snake River Plain Aquifer has also increased in recent decades (Clark et al. 1998, p. 9) and this, along with degraded water quality within the aquifer (Clark and Ott 1996, p. 555), may be the most serious threat to the species.

While Richards (2004, pp. 41-42) has provided compelling evidence that the New Zealand mudsnail (*Potamopyrgus antipodarum*) competes with and can displace the Bliss Rapids snail, the two species can still be found to coexist and may be present in moderate to high densities in adjacent habitats. While it is likely that the invasive New Zealand mudsnail has negatively affected the Bliss Rapids snail, it is difficult to quantify this effect after the fact. There are a suite of other invasive species that currently pose threats to aquatic habitats throughout the west (e.g., zebra and quagga mussles, Eurasian milfoil), and it is not know if these species could become established in habitats occupied by the Bliss Rapids snail or the impacts they would have should they become established. Given the irruptive and devastating effects invasive species such as these can have on habitats in which they are not native, their introduction poses great concern to any native species with a restricted range such as the Bliss Rapids snail.

7.3 Effects of the Proposed Action

The implementing regulations for section 7 define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline" (50 CFR § 402.02). "Indirect effects" are caused by or result from the agency action, are later in time, but are still reasonably certain to occur. Indirect effects may occur outside of the immediate footprint of the project area, but would occur within the action area as defined (50 CFR § 402.02).

7.3.1 Direct and Indirect Effects of the Proposed Action

Program actions involving in-water work or work below the OHWM may have adverse effects to snails and their habitats. These activities could result in erosion and sediment delivery to the Snake River, its tributaries or adjacent cold water springs complexes. These effects can degrade or inundate habitat used by snails during all life history phases, could reduce food abundance and could cause snail mortality. Bank stabilization actions (e.g., rip-rap, gabion baskets) conducted below the OHWM may also crush and kill snails. We expect the BMPs incorporated into the Program to reduce the magnitude and severity of these potential impacts to snails, but not to a level of insignificance. The delivery of contaminants such as fuel, oil, or concrete washout water to Bliss Rapids snail habitat during implementation of Program actions may also impact snails. However, with implementation of the BMPs we expect these effects to be insignificant. The Program will not appreciably reduce the likelihood of both the survival and recovery of this species.

It should be noted that due to the programmatic nature of the proposed action, we lack site specificity regarding potential effects to the Bliss Rapids snail. We will be able to better address potential effects during the pre-project review process where the Agencies provide site-specific information for each proposed Program action. The Service can then ensure consistency with the analyses and conclusions included in this Opinion. If the pre-project review identifies that a Program action is not consistent with our Opinion, that action will need to undergo a separate section 7 consultation.

7.3.2 Effects of Interrelated or Interdependent Actions

The Service has not identified any effects from interrelated or interdependent actions.

7.4 Cumulative Effects

The implementing regulations for section 7 define cumulative effects to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Some of the most pertinent cumulative impacts to the Bliss Rapids snail lie on lands adjacent to the Snake River corridor, but affect the water resources that are critical to the continued survival of the snail. As discussed above, the Snake River Plain Aquifer probably represents the most important single resource for the conservation of the Bliss Rapids snail, but it is heavily influenced by human use. Aquifer depletion and contamination are global problems (Foster and Chilton 2003, p. 1957, Loague and Corwin 2005, p. 1) that threaten human welfare as well as biological diversity (Deacon *et al.* 2007, p. 688). While most of these impacts to the Snake River Plain Aquifer do not occur within the action area, the resulting impacts affect water resources in the action area via a direct pathway. As illustrated in Figure 2 in Kjelstrom (1992, pp. 1-2), groundwater pumping has resulted in declines of spring discharges over the past 60 years. While aquifer recharge has been suggested as a partial solution to over-pumping (IDWR 1999, pp. ix-xi), this may be overstated and may also increase the level or risk or aquifer contamination (Foster and Chilton 2003, pp. 1959-1961; 1967-1970).

Clark *et al.* (1998, p. 17) found the largest amounts of pesticides to be present in wells adjacent to agricultural areas around the Snake River between Burley and Hagerman, which are also the locations with the highest frequencies and concentrations of nitrates. Nitrate concentrations showed significant increases at several major springs, most with populations of the Bliss Rapids snail, from 1994 through 1999 (Baldwin *et al.* 2000, Fig. 18, pp. 22-23). The effects of these contaminants on the Bliss Rapids snail are not known, but in numerous wells these nitrate values have been recorded to exceed human health standards (Neely 2005, p. 2.7) and the presence of nitrates and other contaminants (Holloway *et al.* 2004, pp. 4-6; Carlson and Atlakson 2006, pp. 3-5) illustrate the direct pathway from agricultural areas to the sensitive habitats of the Bliss Rapids snail and other sensitive species.

Agriculture water quality issues within the action area are not restricted to aquifer-spring sources, but are widespread in surface water sources and conveyances (e.g., streams, irrigation return canals) (Clark *et al.* 1998, p. 17). For that reason, the effects of water quality degradation within the Snake River and some tributaries must be considered on the river-dwelling populations of the Bliss Rapids snail. State programs to meet Total Maximum Daily Load (TMDL) requirements have met with some success, but some portions of the Snake River, including those adjacent to and upstream of known Bliss Rapids snail populations, have not met TMDL standards. In addition, TMDL criteria for the middle Snake River have only been established for a limited number of contaminants (total phosphorous, total suspended solids), and do not include other nutrients, pesticides or consider the synergistic effects of these contaminants with one another (e.g., Hoagland and Drenner 1991, pp. 1-29). In addition, such agricultural contaminants, either through ground water or irrigation returns, are regarded as nonpoint source pollutants and are not subject to regulation under the Clean Water Act.

Lastly, aquaculture facilities make up a significant amount of non-consumptive water use in the middle Snake River region, and use an estimated 2,500 cfs of groundwater before releasing that water into the Snake River. This use contributes wastes from fish food, fish metabolism, and processing (Clark *et al.* 1998, p. 9) as well residual antibiotic and antiseptic compounds to the Snake River (EPA 2002, p. 4-19). While many of these facilities are permitted by the Environmental Protection Agency under the National Pollutant Discharge Elimination System

(NPDES), those facilities producing less than 20,000 pounds of fish (dry weight) per year are exempt from NPDES requirements and are not federally regulated. Most, if not all, of these issues or programs (e.g., aquifer recharge) are derived from private, local, or state initiatives and have little to no Federal oversight. As such, aquifer management and nonpoint source pollutant issues will likely continue to provide challenges into the future.

7.5 Conclusion

The Service has reviewed the current status of the Bliss Rapids snail, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to jeopardize the species continued existence. No critical habitat has been designated for the species, therefore none will be affected.

While some individuals may be killed as a result of the action and others disturbed, any impacts will be limited in duration and spatial extent and will not amount to an appreciable change in the status, distribution, or long-term persistence of the species. The adverse effects are not expected to appreciably reduce the likelihood of survival and recovery of the Bliss Rapids snail rangewide in terms of numbers, distribution, or reproduction of the species.

7.6 Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without specific exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of take in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying these species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Agencies have a continuing duty to regulate the activity covered by this incidental take statement. If the Agencies fail to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Agencies must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

7.6.1 Amount or Extent of Take Anticipated

Program actions involving in-water work or work below the OHWM may harm or kill individual Bliss Rapids snails. But the Service expects there will be few Program actions that will impact the Bliss Rapids snail during the 5 years of Program implementation. In addition, the BMPs incorporated into the Program are designed to reduce impacts to the Bliss Rapids snail. Given these considerations, the amount of take in the form of harm or mortality is expected to be low. Quantifying take is difficult because the exact location of Program actions is not known and the number of snails at any given site is also unknown (e.g., as discussed above, densities within Banbury Springs range from 350 snails/sq m to 5,800 snails/sq m). We will therefore use the amount of affected habitat as a surrogate for anticipated take. We predict that all snails within an area 600 feet directly downstream of any in-channel Program work will be harmed from elevated suspended and deposited sediment. Authorized take will be exceeded for any individual in-channel project if the downstream extent of suspended or deposited sediment exceeds 600 feet.

We also predict that all snails in the immediate vicinity of Program bank stabilization work conducted below the OHWM will be harmed or killed. The linear extent of bank stabilization work at any given location is not known. However, no individual project will be more than 300 feet in length and there will be no more than two bank armoring projects approved in any subbasin (4^{th} Field HUC) per year. Therefore, authorized take will be exceeded if any individual project is longer than 300 feet or if there are more than two projects per year in any subbasin inhabited by the Bliss Rapids snail.

7.6.2 Effect of the Take

In the accompanying Biological Opinion, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of the Bliss Rapids snail across its range.

The Bliss Rapids snail is documented to occur in the Snake River basin of southern Idaho from Indian Cove Bridge (RM 525.4) to the Twin Falls area (RM 610.5), but documented extant populations are more restricted, being collected from the Snake River near King Hill (RM 546) to below Lower Salmon Falls Dam (RM 573), and from spring tributaries as far upstream as Elison Springs (RM 604). Estimated densities throughout its range vary widely. Given their patchy distribution, it is not certain that snails will be present in the vicinity of any given Program action, but it is reasonable to assume they will be. The amount of habitat that will be lost or impacted as a result of the proposed Program represents a small amount of occupied and available habitats. Further, the number of individuals expected to be killed as a result of the Program is small relative to total population numbers for the species. Given the relatively small area expected to be impacted within the area known or potentially occupied by the species, it is unlikely that the loss of any snails present in the Program area would have an appreciable effect on survival and recovery of the Bliss Rapids snail. In addition, it is likely that any remaining habitat within the Program area will be recolonized by the Bliss Rapids snail from adjacent colonies following completion of individual Program actions. As such, take in the form of mortality and harm may occur, but is not expected to jeopardize or appreciably diminish overall numbers, distribution, or reproduction to the extent that it would influence persistence of the Bliss Rapids snail into the future.

7.6.3 Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of take on the Bliss Rapids snail.

1. Minimize the potential for disrupting Bliss Rapids snail habitat from Program implementation.
2. Minimize the risk of harm and mortality to the Bliss Rapids snail.

7.6.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1a. As needed during any dewatering, the Agencies will identify for contractors where pump water from the dewatered area will be disposed. All necessary measures (e.g., settling ponds) will be taken to ensure that no sediment from pump water will reach Bliss Rapids snail habitat.

1b. All erosion and sediment control measures will be maintained until construction is complete and disturbed areas are stabilized.

2. Prior to conducting any in-channel or bank stabilization work in Bliss Rapids snail habitat (especially spring habitat) contact the Service for additional specific information on the distribution of the Bliss Rapids snail and the need for implementing additional protection measures.

7.6.5 Reporting and Monitoring Requirement

In order to monitor the impacts of incidental take, the Federal agency or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR 402.14 (i)(3).

1. As part of the process for implementing the Program, the Department is required to provide appropriate post-Project Monitoring Forms to the Service within 45 days of project completion. The Department will also host an annual coordination meeting to review the projects implemented under the Program during the previous year.
2. During project implementation, the Agencies shall promptly notify the Service of any emergency or unanticipated situations arising that may be detrimental for the Bliss Rapids snail relative to the proposed Program.

7.7 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species.

1. Whenever concrete is used, restrict washout of concrete trucks and equipment to locations that will minimize the risk of introducing wastewater to Bliss Rapids snail habitat.

2. Take all necessary precautions to avoid introducing petroleum contaminants to Bliss Rapids snail habitat.

8. NORTHERN IDAHO GROUND SQUIRREL

8.1 Status of the Species

8.1.1 Listing Status

The northern Idaho ground squirrel (NIDGS) was listed as threatened under the Act on April 5, 2000 (65 Federal Register 17,779-17,786). On July 28, 2003, the Service approved a Recovery Plan (Fish and Wildlife Service 2003) that provides direction for recovery of the species, including population sizes and criteria for a minimum number of viable metapopulations.

The Recovery Plan identifies 12 existing and potential metapopulation sites. The exact boundaries of these sites are considered somewhat fluid and will be revised as new surveys, habitat, and population information becomes available. The metapopulation sites include lands administered by the U.S. Forest Service, the Idaho Department of Lands, and private landowners. To date, one Habitat Conservation Plan and one Safe Harbor Agreement with private landowners have been completed for this species (Fish and Wildlife Service 2006 and 2007).

8.1.2 Reasons for Listing

Section 4 of the Act and regulations promulgated to implement the listing provisions of the Act (50 CFR part 424) set forth the procedures for adding species to the Federal list. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the Act. All five factors apply to the NIDGS: the present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence.

8.1.3 Species Description

The NIDGS belongs to the small-eared group of true ground squirrels. Yensen (1991, p. 583) described the NIDGS as taxonomically distinct from the southern Idaho subspecies (*Spermophilus brunneus endemicus*) based on morphology, fur, and apparent life-history differences, including biogeographical evidence of separation. The NIDGS occurs only in west-central Idaho in Adams and Valley Counties. It has a reddish brown back with faint light spots and a cream-colored belly. The back of the legs, top of the nose, and underside of the base of the tail are all reddish brown. The NIDGS have ear pinnae that project slightly above the crown of the head (Yensen and Sherman 2003, p. 3). The NIDGS can be distinguished from the other subspecies, the southern Idaho ground squirrel, and other small-eared ground squirrels, by its smaller size and rustier fur color.

Recent work suggests that southern Idaho ground squirrels may be descended from NIDGS, and the NIDGS population in Round Valley may be the common link between the two subspecies (Hoisington 2007, pp. 100-101). Hoisington (2007) used the cohesion species concept to test whether genetic and ecological data support species level classification of the two subspecies of

Idaho ground squirrel. Her results support not only the subspecies distinction, but also support raising the two subspecies to species status (Hoisington 2007, p. 99-104).

8.1.4 Life History

The NIDGS occupies dry (or xeric) meadows surrounded by ponderosa pine (*Pinus ponderosa*) or Douglas-fir (*Pseudotsuga menziesii*) forests (Yensen 1991, p. 595). Xeric meadows have shallow soils (Dyni and Yensen 1996, p. 99). However, NIDGS sites need to be deep enough to accommodate nest burrows greater than 3.3 feet deep (Yensen et al. 1991, p. 98, Yensen and Sherman 1997, p. 3); dry vegetation sites with shallow soils of less than 19.5 inches depth above bedrock are used for auxiliary burrow systems (Yensen et al. 1991, p. 95). NIDGS often dig burrows under logs, rocks, or other objects.

Although Columbian ground squirrels (*Spermophilus columbianus*) overlap in distribution with the NIDGS (Dyni and Yensen 1996, p. 99), Columbian ground squirrels prefer moister areas with deeper soils. Sherman and Yensen (1994, pp. 8, 11) reported that the segregation of the two species is due to competitive exclusion as opposed to differing habitat requirements.

The NIDGS emerges in late March or early April and is active above ground until late July or early August (Yensen 1991, p. 593). Emergence during this period begins with adult males, followed by adult females, and then yearlings. The NIDGS becomes reproductively active within the first two weeks of emergence (Yensen and Sherman 1997, p. 3). Females and males are sexually mature the first spring after birth. Females produce one litter per year of between two and seven pups, depending on fitness. Males and females do not live together or near their mates, and females do not cooperate with close kin to defend burrows or rear young (Yensen and Sherman 1997, p. 4).

Females that survive the first winter live, on average, nearly twice as long as males (3.2 years for females and 1.7 years for males). Estimates of maximum longevity indicate that males may live up to 5 years and females up to or greater than 7 years (Sherman and Runge 2002, p. 2821). Males normally die at a younger age than females, typically from mortality associated with reproductive behavior. During the mating period, males move considerable distances in search of receptive females and often fight with other males for copulations, thereby exposing themselves to predation by raptors such as prairie falcons (*Falco mexicanus*), goshawks (*Accipiter gentilis*), and red-tailed hawks (*Buteo jamaicensis*). Significantly more males die or disappear during the two week mating period than during the rest of the 12 to 14 week period of above-ground activity (Sherman and Yensen 1994, p. 2). Seasonal torpor or hibernation generally occurs in early to mid-July for adult males and females, and late July to early August for juveniles (Yensen 1991, p. 593).

8.1.5 Population Dynamics

As a result of the factors described in the Life History section, and due to the small sizes of the remaining population sites, the NIDGS may have little resilience to naturally occurring events. Small populations are often vulnerable to climatic fluctuations and catastrophic events (Mangel and Tier 1994, pp. 607-614). In 1993, Gavin et al. (1999) developed a population viability simulation program using recruitment and death values recorded over 8 years from an intensively studied NIDGS population site. This model determined that all but 1 of 100 population sites could become extinct in less than 20 years. A 1999 population model developed by the U.S.

Geological Survey-Patuxent Wildlife Research Center, predicted that existing populations could become extinct within 7 years if no conservation measures are taken.

In a metapopulation system such as that of NIDGS, the extinction and re-colonization of local populations is perceived to be a natural occurrence. Some local populations may be larger and more robust than others because of the availability of suitable resources such as well drained soils, above-ground structure for cover, and diverse and nutritious food sources. These productive sites are often referred to as "source populations." Areas that harbor less resource value may support small populations during periods of ideal climatic conditions but may not remain viable when climatic conditions further reduce the resource value. These sites are referred to as "sink populations" in that most of the animals that occur there arrive via dispersal from source sites (Meffe and Carroll 1994, pp. 186-189).

In general, larger local populations have a greater ability to persist through intermittent fluctuations in climate and food resources and can serve as source populations, through dispersal, for less viable populations or can re-colonize local populations that have gone extinct (Meffe and Carroll 1994, pp. 187-188). A necessity for this process to work is the connectivity among local populations, a characteristic that is now lacking across substantial portions of the NIDGS range. Sink populations, although potentially intermittently occupied, are valuable to the metapopulation as well. They can contribute genetic diversity and can serve as a bridge between other source populations that would otherwise lack connection.

For several years, population sites with the largest numbers of NIDGS have been closely monitored by researchers. These sites occur within the Payette National Forest (Slaughter Gulch campground) and the privately-owned OX Ranch. The two population sites on the OX Ranch (Squirrel Manor and Squirrel Valley) have been monitored for the longest period of time. Sherman and Gavin (1999, pp. 5-7) and Sherman and Runge (2002, p. 2819) documented the decline of the Squirrel Valley population from 272 individuals in 1987 to 10 in 1999. The Squirrel Manor had a population decline from 250 individuals in 1996 to fewer than 50 individuals in 1999. Each of four other population sites monitored between 1998 and 1999 declined markedly. The declines in 1999 may have been largely due to cold, spring conditions (Sherman and Gavin 1999, p. 2), whereas the longer-term declines may be related to declining habitat conditions.

Since 1999, IDFG has detected a generally increasing trend in NIDGS populations (Evans Mack and Bond 2008, p. 9). Of the monitored populations, only the Cold Springs population appears to be at or below the levels recorded in 1999; all other populations have increased. In addition to a general trend of an increasing number of NIDGS, new populations, or populations formerly believed to be extirpated, have been documented. Specifically, the Lost Valley Camp Ground and Tree Farm populations were either repopulated or redetected in 2000 and 2001, respectively. New populations were detected at the Lick Creek lookout in 2006, and at four additional sites in 2008. The overall population estimate for 2008 was 1,512 adults and yearlings; this estimate represents an increase over the 2007 population estimate and a marked increase from population estimates from 1999.

8.1.6 Status and Distribution

The NIDGS is found only in Adams and Valley counties of western Idaho. It has the smallest geographic range of any squirrel subspecies and one of the smallest mammal ranges in North

America (Gill and Yensen 1992, p. 155). Its present range is north of Council, Idaho, with one location in Round Valley, and covers an area of about 230,000 acres. Within this extent, NIDGS are known to occur at 43 isolated sites within an elevation range of 1,312 to 7,565 feet (Evans Mack 2006, p. ii). Historically, its range probably was much larger and extended southeast to Round Valley near Cascade, Idaho. Of the 43 known occupied sites in 2006, five sites supported greater than 100 individuals (Squirrel Manor, Lost Valley, Price Valley, Price Valley South, and Round Valley), 22 of 43 sites supported less than 20 individuals, and three metapopulation areas (Price Valley, Lost Valley, and Bear Meadows Complex) supported greater than 200 individuals with two nearing 600 (Evans Mack 2006, p. ii). In 2008, 47 sites were occupied by NIDGS, and the population estimated at 1,512 adults and yearlings (Evans Mack and Bond 2008, p. 9). The largest colonies continue to occur at Squirrel Manor, Squirrel Valley, Lost Valley Reservoir, and Price Valley (Evans Mack and Bond 2008, p. 9).

8.1.7 Previous Consultations and Conservation Efforts

The Service has conducted numerous informal and formal section 7 consultations with the Forest Service and other Federal agencies. With the exception of the Forest Service Forest Plan revision, the majority of these consultations were on site-specific actions such as timber sales, vegetation management actions, road maintenance and construction, and livestock grazing. To date, only one consultation authorizing incidental take has been issued (Council to Cuprum Road Construction). Due to the nature of the consultations completed to date (individually and in aggregate), these have not compromised the survival and recovery of the NIDGS. Land management on the Payette and Boise National Forests is considered critically important to the species and its habitat because these Forests constitute the primary Federal action agency with the potential to affect its survival and assist in recovery under section 7(a)(1) of the Act (Fish and Wildlife Service 2003) and a significant portion of NIDGS habitat and populations are on Forest Service land.

8.1.8 Conservation Needs

A final Recovery Plan (Plan) for NIDGS was developed and released by the Service on July 28, 2003 (Fish and Wildlife Service 2003). The goal of this Plan is to increase the population size and establish a sufficient number of viable metapopulations of the NIDGS so the subspecies can be delisted. According to the Plan, due to the restricted geographic range and low numbers, the populations of NIDGS must be increased and stabilized. The only historical population level recorded was in 1985 when it was estimated to be approximately 5,000 individuals (Yensen 1985, p. 12). This estimate was made for populations judged to be in decline; hence, it is thought that the recovery target needs to be higher than this historical estimate (Fish and Wildlife Service 2003, p. v). The Plan states that the recovery target for the species is based on an effective population size (*Ne*) of 5,000 among a minimum of 10 metapopulations. Delisting may be considered when four recovery criteria identified in the Plan have been met.

1. Of the 17 potential metapopulations that have been identified within the probable historical distribution, there must be at least 10 metapopulations, each maintaining an average effective population size of greater than 500 individuals for 5 consecutive years.
2. The area occupied by a minimum of 10 potential metapopulations must be protected. In order for an area to be deemed protected, it must be: (a) owned or managed by a

government agency with appropriate management standards in place; (b) managed by a conservation organization that identifies maintenance of the subspecies as the primary objective for the area; or, (c) on private lands with a long-term conservation easement or covenant that commits present and future landowners to the perpetuation of the subspecies.

3. Site-specific management plans have been completed for the continued ecological management of habitats for a minimum of 10 potential metapopulation sites.
4. A post-delisting monitoring plan covering a minimum of 10 potential metapopulation sites has been completed and is ready for implementation.

8.1.9 Critical Habitat

No Critical Habitat for NIDGS has been designated.

8.2 Environmental Baseline of the Action Area

This section assesses the effects of past and ongoing human and natural factors that have led to the current status of the species, its habitat and ecosystem in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with the consultations in progress.

8.2.1 Status of the NIDGS in the Action Area

The Assessment states that two NIDGS occupied sites occur adjacent to highways administered by the Department (as of February 2010). The location of these sites is described as:

- S.H. 55 from Round Valley Road (north of Smith's Ferry) north to Herrick Hills Subdivision, mileposts 102 to 105.
- U.S. 95 from Tamarack (north of Lost Valley Road) north/east to almost the New Meadows city limits, mileposts 154 to 158.75.

8.2.2 Factors Affecting the NIDGS in the Action Area

In general, the primary threats to NIDGS include habitat loss, degradation, and fragmentation due to conifer encroachment into meadow habitats, changes in vegetation composition and structure, agricultural conversions, and rural development. Other threats identified include mortality associated with roads, poisoning, illegal recreational shooting, competitive exclusion by the larger Columbian ground squirrel, and demographics of small populations (Fish and Wildlife Service 2003, p. iv).

8.3 Effects of the Proposed Action

The implementing regulations for section 7 define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline" (50 CFR § 402.02). "Indirect effects" are caused by or result from the agency action, are later in time, but are still reasonably certain to occur. Indirect effects may occur outside of the immediate footprint of the project area, but would occur within the action area as defined (50 CFR § 402.02).

8.3.1 Direct and Indirect Effects of the Proposed Action

Program activities may impact the northern Idaho ground squirrel through a number of mechanisms. Program activities near any NIDGS-occupied sites will likely result in temporary disturbance of individual squirrels during their active season (April through early August). The effect of such disturbance will be a temporary alteration in an individual NIDGS's activity pattern (e.g., increased sheltering and decreased feeding). NIDGS may also be killed if ground disturbing work occurs when squirrels are in their burrows or if construction vehicles or equipment crush squirrels inadvertently when driving, working, or parking off the roadway.

The Agencies will implement the following protection measures to reduce impacts to the NIDGS:

1. Determine if a project is within or near known occupied NIDGS sites or modeled suitable habitat. NIDGS occurrence is dynamic across the landscape, and this distribution likely will change over time.
2. Conduct project-specific presence/absence surveys for the NIDGS within occupied sites or modeled suitable habitat prior to any ground-disturbing activities. Surveys should follow the protocol established by the Service and Idaho Department of Fish and Game, which specifies qualified individuals, timing, number of visits, weather considerations, etc. The prime survey periods are (1) shortly after adult/yearling emergence in spring when squirrels are breeding and not obscured by growing vegetation (beginning early April at lower elevations and adjusted accordingly by elevation and snow pack), and (2) after pup emergence in summer (beginning early June at lowest elevations). Ability to hear and recognize a northern Idaho ground squirrel call is important, as many times that is the first detection. This high-frequency call can be confused with grassland sparrow species, so it takes experience and no high-frequency hearing loss. Coordination with the Idaho Department of Fish and Game is helpful prior to conducting surveys.
3. At locations determined to be occupied (from project-specific surveys), schedule construction activities to reduce conflicts. Projects that involve excavation (e.g., working beyond the existing roadway, replacing culvers, widening, etc.) at or near occupied sites should be scheduled after pups have emerged and before adults retreat below ground to hibernate. This window occurs early June through the first week of July at lower elevations and is adjusted accordingly for higher elevations.
4. At locations determined to be occupied, monitor squirrel behavior during construction using a qualified individual. On-site monitoring during construction allows for adaptive modifications.
5. At locations determined to be occupied, restrict indiscriminate parking of vehicles and heavy machinery to existing disturbed areas. Conduct clearance surveys to designate parking and staging areas. Vegetated road edges should be avoided.
6. Conduct presence/absence surveys at material source sites and waste sites associated with projects if these locations occur in modeled habitat.

8.3.2 Effects of Interrelated or Interdependent Actions

The Service has not identified any effects from interrelated or interdependent actions.

8.4 Cumulative Effects

The implementing regulations for section 7 define cumulative effects to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The predominant ongoing activities on non-Federal lands that are reasonably certain to affect NIDGS and their habitat include timber harvest, livestock grazing, road construction, recreation, fire suppression, and residential development. Land uses also include limited amounts of cultivation and irrigation of hay fields and pastures, water diversions and water-right allocations, and residential development.

State and private land timber harvest and related road construction activities within Idaho are regulated by the Idaho Forests Practice Act (IFPA), under the Idaho Department of Lands (IDL). Activities that are implemented pursuant to the IFPA that may not provide adequate protection for NIDGS and their habitat include: road construction and maintenance, timber harvest, and fire management. Conversely, forest management that reduces tree stocking and increases openings could have a beneficial effect on the species. There is one known NIDGS colony on State land and several private tracts where these actions are reasonably certain to directly or indirectly affect ground squirrels.

There are pathways for both adverse and beneficial effects on ground squirrels from livestock grazing. State lands leased for grazing are currently operated under BMPs established under Grazing Management Plans, overseen by the IDL. Grazing BMPs as identified in the Idaho State Agricultural Pollution Abatement Plan (State Plan) are not mandatory but recommended for private lands. Because compliance with the State Plan is not required on private lands, no monitoring plan is in place to evaluate potential impacts to Act listed species or designated critical habitat. The IDL does perform monitoring of larger tracts of leased lands to ensure compliance with established grazing management plans. However, smaller, more isolated blocks of leased land are often not monitored for compliance and managed according to lands surrounding them (private or federal). Grazing management plans as currently required by IDL are authorized for ten-year terms, leading to an inability to incorporate new and more ecologically friendly practices as these practices evolve. State management plan BMPs typically revolve around season of use and animal unit months (AUMs), not focusing on riparian area monitoring and protection. Given the limited controls on grazing under state oversight, it is unlikely that management would be carried out to assure adverse effects on ground squirrels would be avoided and minimized.

As with timber management and grazing, recreation and fire management on non-Federal lands does not come with assurances of protection of listed species. The general nature of impacts of these activities on ground squirrels is described above. It is reasonably certain that adverse effects on the species could result from these activities. A number of ground squirrel colonies are located on private lands that are presently managed for agricultural uses. There is potential from the development of parts of these properties for residential use, and subsequent loss of NIDGS habitat.

The Act provides options for non-Federal entities to develop conservation agreements and Habitat Conservation Plans that address management and development effects on candidate, proposed, and listed species. Landowners in the general vicinity of the action area have been working with the Service to conserve other species, including southern Idaho ground squirrel. It is possible that in the future, NIDGS may benefit from actions carried out under similar private/Federal agreements.

8.5 Conclusion

The Service has reviewed the current status of the NIDGS, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to jeopardize the continued existence of the NIDGS. This determination is based upon the following considerations:

- Although the proposed action may have some adverse effects on a small number of individual NIDGS, these effects are not likely to cause a measurable response in NIDGS populations.
- Proposed Program protection measures are expected to reduce impacts to NIDGS from Program implementation.

Direct modifications to NIDGS habitat are expected to be limited and impacts to the extant populations would likely be minor. The Program will not reduce the reproduction, status, distribution, or genetics of NIDGS to a point where the likelihood of its survival and recovery is appreciably reduced.

There is no critical habitat designated for the NIDGS, therefore none will be affected.

8.6 Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without specific exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of take in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying these species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Agencies have a continuing duty to regulate the activity covered by this incidental take statement. If the Agencies fail to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Agencies must report the progress of the Program and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

8.6.1 Amount or Extent of Take Anticipated

While the protection measures incorporated into the Program are expected to minimize risk to NIDGS, the Service anticipates that take in the form of death or injury to individual NIDGS, and harassment of individual squirrels are reasonably certain to occur as a result of Program implementation. Calculation of the amount of incidental take that may occur is complicated by the annual variation in the potential numbers of NIDGS that may inhabit an area and uncertainty about exactly where Program activities will occur. We expect that Program activities will only impact NIDGS in two areas: (1) S.H. 55 from Round Valley Road (north of Smith's Ferry) north to Herrick Hills Subdivision, mileposts 102 to 105; and (2) U.S. 95 from Tamarack (north of Lost Valley Road) north/east to almost the New Meadows city limits, mileposts 154 to 158.75.

The Service predicts that two NIDGS may be killed during the 5 year period of Program implementation (one mortality in each of the affected areas described above). Program activities near any NIDGS-occupied sites will likely result in temporary disturbance of individual squirrels during their active season (April through early August). The effect of such disturbance will be a temporary alteration in an individual NIDGS's activity pattern (e.g., increased sheltering and decreased feeding). The amount of take in the form of harassment resulting from the Program is difficult to quantify due to the large number of variables involved in the interaction, however Program activities will likely only result in temporary, short-term disturbances to NIDGS. We will use the amount of potentially affected area as a surrogate for take in the form of harassment. We assume that all squirrels within an impact zone 100 feet on either side of S.H. 55 between MPs 102 and 105 (3 miles) and on either side of U.S. 95 between MP 154 and 159 (5 miles) may be subject to harassment from Program activities.

Authorized take will be exceeded if Program activities result in the death of more than two NIDGS during the 5 year implementation period or if squirrels are harassed outside of the two impact zones along S.H. 55 and U.S. 95 described above. If the incidental take anticipated by this document is exceeded, all such activities will cease and the Agencies will immediately contact the Service to determine if consultation should be reinitiated

8.6.2 Effect of the Take

The Service has determined that the effects from Program implementation will not result in a level of take that will jeopardize the NIDGS. The proposed Program is not expected to significantly reduce the reproduction, status, and distribution of NIDGS in the action area, and will not appreciably reduce the likelihood of survival and recovery of the species. Further, the protection measures incorporated into the proposed Program have been designed to minimize the amount of take.

8.6.3 Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of take on the NIDGS.

1. Minimize the potential for disruption of NIDGS habitat from Program implementation.
2. Avoid disturbing, injuring, or killing NIDGS.

8.6.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1a. Minimize the destruction of plant communities important for the conservation of the NIDGS.

1b. Where revegetation of areas disturbed by Program actions is required, use native plants important for NIDGS forage whenever feasible.

2. Based on the results of pre-project surveys and monitoring, adjust Program actions to avoid impacts to NIDGS. Examples of appropriate adjustments include stopping construction work if NIDGS are present during their above ground period (April through early August), restricting work to daylight hours only, or delineating NIDGS burrow systems to ensure that ground disturbing work does not occur in their vicinity.

8.6.5 Reporting and Monitoring Requirement

In order to monitor the impacts of incidental take, the Federal agency or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR 402.14 (i)(3).

1. As part of the process for implementing the Program, the Agencies are required to provide appropriate post Project Monitoring Forms to the Service within 45 days of project completion. For Program actions completed within NIDGS populations as described above in this Opinion, the Agencies will include the results of any pre-project NIDGS surveys or monitoring. In addition the Agencies will describe what types of adaptive management actions were implemented to avoid impacting NIDGS.
2. Upon locating any dead, injured, or sick NIDGS, or upon observing the death or injury of individual NIDGS as a result of project activities such activities shall be terminated and notification must be made within 24 hours to the Service's Division of Law Enforcement at (208) 378-5333. Additional protection measures may be developed through discussions with the Service.
3. During project implementation, the Agencies shall promptly notify the Service of any emergency or unanticipated situations arising that may be detrimental for NIDGS relative to the proposed Program.

8.7 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species.

1. Work with the Service and IDFG to develop specific measures for minimizing impacts to NIDGS from Program implementation.
2. Develop revegetation plans for restoring NIDGS habitat in appropriate areas under Department jurisdiction.

9. REINITIATION-CLOSING STATEMENT

This concludes formal consultation on the proposed Program. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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